JCI
Jones Chemicals Inc.

14 January 2012

US Environmental Protection Agency
Region 10
Attn: Mr. Wally Moon
Unit Manager
Emergency Preparedness and Prevention Unit
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

RE: RMP Compliance Inspection
EPA Facility ID # 1000 007 8845

Encl: (1) Pipe Testing Protocol
(2) Introduction to JCI's Mechanical Integrity Program
(3) SOP for System Inspections
(4) System Inspection forms for 2011 – JCI Tacoma
(5) Monthly Preventative Maintenance System Inspections – September – December 11'

Dear Mr. Moon-

The purpose of this letter is to respond to your letter received at our Tacoma, Washington facility on January 6th, 2012 requesting that we provide documentation to substantiate that the area of concern listed below has been corrected:

JCI Jones Chemicals, Inc. did not provide documentation and records to demonstrate that the frequency of inspections and tests of all process equipment is consistent with applicable manufacturer's recommendations, good engineering practices, and more frequently if determined to be necessary by prior operating experience as required by 40 CFR 68.73(d)(3). JCI Jones Chemicals, Inc. must establish a written procedure outlining the frequency of inspections and testing for the piping systems and equipment involved with the covered process, chlorine. JCI Jones Chemicals, Inc. referenced the Chlorine Institute Pamphlet #6, Piping Systems for Dry Chlorine, as an industry standard used for inspections of the chlorine system for mechanical integrity.

JCI Jones Chemicals, Inc. has an extremely comprehensive mechanical integrity program that consists of daily walk through inspections of all equipment, monthly documented Preventative Maintenance System inspections to include the procedures to be followed in inspecting/testing each piece of equipment, System Inspections to be conducted on process systems at least annually, training requirements for impacted employees, and Work History files for not only equipment considered to be part of covered processes but all equipment at the Branch on which is documented the work and or repairs performed on that particular piece of equipment.

600 Bethel Avenue • Beech Grove, Indiana 46107 • *telephone:* 317.787.8382 • *facsimile:* 317.787.8384
Corporate Offices • Sarasota, FL • *Branch Locations* • Warwick, NY • Caledonia, NY • Barberton, OH • Riverview, MI • Merrimack, NH
Charlotte, NC • Ft. Lauderdale, FL • Jacksonville, FL • Milford, VA • Tacoma, WA • Torrance, CA
www.jcichemicals.com

Although JCI implemented this program nearly ten years ago, it continues to be a work in progress today as we continue to review and revise our inspection procedures so as to ensure not only that we are complying with EPA regulations but in an effort to cost effectively extend the serviceability of our equipment and systems. With respect to piping system inspections, the Chlorine Institute's Pamphlet #6, Piping Systems for Dry Chlorine, is the primary reference used industry wide in establishing protocol for chlorine process and piping system inspections. In Section 12.3 (Periodic Inspections) of this pamphlet, it specifically states that "Chlorine piping systems should be inspected on a regular basis". While it is our understanding that the interpretation of the periodicity implied by 'regular basis' is somewhat left to the discretion of the company, as a company with approximately 82 years of experience in the industry, JCI Jones Chemicals, Inc. has made the decision that system inspections are to be conducted on an annual basis.

As stated above, we continue to review and revise our inspection procedures and just this past November, inspection procedures applicable to system piping were revised to follow the procedures recommended by the Chlorine Institute.

A copy of these procedures, the Introduction to JCI's Mechanical Integrity Program, the SOP for conducting System Inspections, the System Inspection forms applicable to the inspections conducted at JCI Tacoma during 2011, and the Monthly Preventative Maintenance System inspection forms for the last four months of 2011 have been included with this response. As stated on page MI I-1 of the Introduction to JCI's Mechanical Integrity Program, the specific procedures to be followed in conducting both Preventative Maintenance System inspections and System inspections have been developed "based on manufacturer's recommendations in conjunction with generally accepted good engineering practices and prior operating experiences". It can also said that these procedures are to a large degree, based on the experiences and lessons learned over the course of the company's history since 1930

We take these requirements very seriously at all eleven of our facilities and have developed what we consider to be a standardized program that complies with EPA regulations in an effort to ensure consistency throughout the company.

It is our hope that both the above and the enclosed documents serve to adequately demonstrate the extent to which JCI has gone to develop and maintain an effective mechanical integrity program in accordance with EPA regulations. Should you have any questions and or need any additional information, please feel free to contact me at 1-330-825-4521.

Thank you,
JCI JONES CHEMICALS, INC.

Dan Casmey

DAN CASMEY
Executive VP of Safety, Security & Regulatory Compliance

CC: Mr. Javier Morales, RMP Coordinator, USEPA, Region 10
Mr. Tim Gaffney, Executive VP of Risk Management and Environmental Affairs, JCI Jones Chemicals, Inc.
Mr. Tim Ross, VP of West Coast Operations, JCI Jones Chemicals, Inc.
Mr. James Groh, Branch Manager, Tacoma Branch, JCI Jones Chemicals, Inc.

Appendix D – Pipe Testing Protocol

As part of the Company's Mechanical Integrity Program, we are required to perform Annual System Inspections on covered processes. The specific inspection protocol required to conduct the System Inspections are spelled out in detail in Chapter MI IV (System Inspections) in the Mechanical Integrity Manual. The purpose of this Appendix is to specifically outline the procedures to be followed with respect both visual and pressure testing requirements while conducting the internal inspections on process piping. The procedures outlined provide the 'step by step' process that must be followed to visually inspect and test chlorine and sulfur dioxide systems. The testing protocol is broken down into (7) steps to ensure that the sources of the product are secured and that the system is free of all product and product residue. The steps also cover internal visual inspection, pneumatic and product gas testing requirements and the required record keeping (documentation) requirements. The testing protocol steps are as follows:

1. Disconnect and Red Tag System
2. Vacuum entire system
3. Air sweep system
4. Visual Inspection
5. Pneumatic Testing
6. Product Gas Testing
7. Documentation of Results

Disconnect and Red Tag System

Ensure all compressed gas receptacles; i.e., chlorine and or sulfur dioxide railcars, ton containers, and cylinders, are completely disconnected from the plant system to be tested (fill, blow or vacuum). Once all receptacles are disconnected, cap off all lines. Place all railcars 'Out of Service' via locked dome and red tag until the system inspection is completed.

Vacuum System

Place the entire compressed gas (chlorine or sulfur dioxide) system on an extended vacuum to include both blow and liquid systems. The purpose of the extended vacuum is to remove all residual gas from the specific system to be tested. Vacuum (3-4) hours minimum or preferably overnight. After the system has been on an extended vacuum, check all pipelines and blow tons to ensure there is no 'frost line' visible indicating the presence of compressed gas still in the system. ***Please Note: If any frost is detected anywhere in the system, then the process must***

be shutdown in order to allow time for the system to thaw out. Once thawed out, start the vacuum process over again.

Air Sweep System

The purpose of the 'air sweep' is to provide added assurance that the system is free of all product. The 'low pressure air sweep' will begin with the release of the vacuum from the compressed gas system allowing the system being tested to return to normal atmospheric pressure. Then proceed to the farthest points on your compressed gas system (chlorine or sulfur dioxide) and connect either a plant or pad airline (Must be -40° dewpoint air) to the system. **This connection must be a screw fitting connection.** Once the airline is connected to the compressed gas system, open the blow line to a receiving vat or tote containing caustic. Slowly apply low pressure air (10 -20 psi) into the compressed gas system. Open the blow tons slowly allowing air to travel into the vat. Air sweep the entire 'blow and liquid' system for (30 - 60) minutes. ***Please Note: You may have to sweep from various points (One at a time) in the system depending on specific system design. The object of the air sweep is to ensure all product is removed from the system.*** Upon completion of the air sweep, check the system for the presence of product via aqua ammonia. If residual product is still present, continue to air sweep, until all lines are clear and no product is detected.

Visual Inspection

Once the air sweep has been completed, shut down the air flow, and allow the system to return to natural atmospheric conditions. At this point, the system should be clear and dry with no product detected in the pipelines. A visual inspection of the pipelines can now be completed. Remove predetermined inspection plugs or gauge lines and or disconnect pipe fittings to allow an internal visual inspection. The points at which the inspection is to be conducted should be low areas and horizontal piping runs where problems such the accumulation of ferric chloride (chlorine) or sulphorous acid (sulfur dioxide) tends to occur. ***Please Note: Ensure you have an adequate number of inspection points to fully cover your system.*** It is important to indentify and mark in red where these inspection points exist in your system to ensure you are checking the same points annually to monitor the progression of a possible issue. Visual inspection criteria will be the same as an internal inspection of a ton container. The pipeline will be inspected utilizing a fiber optic light and or fiber optic camera device to identify the following:

- Moisture – The inspection points should be dry. The presence of moisture or wet sludge indicates a problem. If moisture or sludge is present, additional points in the system above and beyond the normal inspection points will need to be inspected to identify the

entire scope of the problem. Once the scope of the problem is identified, the system or area must be cleaned and dried and the inspection process started over or the contaminated sections can be entirely replaced.

- Line Corrosion – Line corrosion indicates a problem that may have existed in the past. If line corrosion is found, additional points in the system above and beyond the normal inspection points need to be inspected to identify the entire scope of the problem. Excessive line corrosion will require the line or section of piping to be replaced. Light line corrosion needs to be documented for future inspections.
- Pitting - Pitting also indicates a potential problem in the system. If pitting is found, additional points in the system above and beyond the normal inspection points need to be inspected to identify the entire scope of the problem. Excessive pitting will require the section of piping to be replaced. Minimal isolated pitting needs to be documented for future inspections.

Upon completion of the visual inspection, all inspection ports should be capped off or rejoined. If the visual inspection indicates a dry pipeline free of excessive buildup with no excessive line corrosion or excessive pitting, the inspection can continue to the pneumatic inspection.

Pneumatic Testing

The pneumatic testing is similar to the air sweep. Close off the blow line going to the vat. Close off the vacuum valve on the vacuum ton going to the vats (Loop side only). Disconnect and plug off the vacuum gauges and blow gauges. Remove and plug off the pressure switches on the vacuum tons. Slowly allow air pressure to build up in the compressed gas system. The system should be pressurized to 110% of normal design pressure of the system. Most JCI systems are designed to 150 PSI of working pressure, thus pressurize to 165 PSI. (If your system operates above 150 PSI, test at 110% of your designed working pressure.) Once the system is pressurized and maintaining the pressure (30 minutes minimum), the system must be checked with soapy water. Air bubbles will indicate any leaks. If any leaks are identified, the system must be repaired and retested. If no leaks are detected, the system can be slowly degassed into a vat or tote. ***Please Note: PVC vacuum piping will follow the same pneumatic pressure testing criteria except PVC vacuum piping will be tested with low pressure (20-30 PSI) pneumatic pressure.***

Product Gas Testing

Once the system has passed both the visual inspection and the pneumatic testing it will undergo the final step in the inspection process, the 'Product Gas Test'. Reinstall all gauges and pressure switches back into the system. The vacuum system will be restarted. Once a vacuum

is present, connect one ton container containing product. The product gas testing will be completed by introducing product gas back into the liquid and blow portions of the system. Open the 'hooked up' ton on the gas phase of a container allowing product (chlorine or sulfur dioxide gas) back into the system **(Gas only).** Once the liquid and blow system has product present, the systems will be leak checked with 'aqua ammonia'. Any detected leaks will need to be repaired and retested before the system can be operated again. If no leaks are detected, the system is to be vacuumed down as normal. As the system is being vacuumed down, the vacuum system itself should be checked for leaks via aqua ammonia. Once all parts of the system (liquid, blow and vacuum) have passed the visual inspection and the pneumatic and product gas testing requirements, it can be placed back into service.

Documentation Requirements

The final step in the process is the documentation of the system inspection. The specific testing documentation is to be filled out in accordance with JCI – System Inspection criteria (MI V). The pipe testing documentation at the end of this Appendix must also be filled out in addition to the System Inspection documentation on all covered process.

Piping - Visual Inspection and Pneumatic Testing

System Being Tested: **Chlorine** _____ **Sulfur Dioxide** _____

Test Date and Time: **Start** _____ **End** _____

Disconnect and tag out of system

I have verified the following:

- All railcars, tons, and cylinders have been completely disconnected from the system being tested and all lines capped off.
- All railcar domes have been locked and red tagged 'Out of Service'?

Verification _____ _____

Vacuum System

I have verified the following:

- The entire system being tested has been placed on vacuum for a minimum of (3-4) hours? How long? _____
- The system has been checked to ensure no visible frost is present on any pipeline or system components.

Verification _____ _____

Air Sweep

I have verified the following:

- The entire system has been air swept for _____ minutes / hours.
- Upon completion of the air sweep and inspection, no product was detected in the system.

Verification _____ _____

Visual Inspection

Using 'M' for moisture, 'LC' for line corrosion, 'P' for pitting, and 'S' for satisfactory, indicate the results of the visual inspections:

Location	*Results*
Point # 1	
Point # 2	
Point # 3	
Point # 4	
Point # 5	
Point # 6	
Point # 7	
Point # 8	
Point # 9	
Point # 10	

Explain, in detail, what was done or needed to rectify any problem preventing the system from passing the initial visual Inspection.

I have verified the following:

- All visual inspections have been completed.
- All failures of the visual inspection have been investigated and have now been rectified.

Verification _____ _____

Pneumatic Testing

Perform the pneumatic testing. Explain, in detail, what was done or needed to rectify any problem preventing the system from passing the pneumatic inspection.

I have verified the following:

- All gauges or pressure switches that can be affected by the pneumatic test pressure have been removed and plugged off.
- The system (steel piping) was pneumatically pressure tested at _____PSI for_____ minutes.
- The system (PVC piping) was pneumatically pressure tested at _____PSI for_____ minutes.
- Any or all leaks have been repaired or parts replaced.
- The system has passed pneumatic testing.

Verification _____ _____

Product Gas Testing

Perform the product gas test. Explain, in detail, what was done or needed to rectify any problem preventing the system from passing product gas testing.

I have verified the following:

- Any or all leaks have been repaired and or all defective parts have been replaced.
- The system has passed product gas testing.

Verification _____ _____

Documentation

I have verified the following:

- The _____piping system has met all the Company requirements to successful pass the System Inspection – Piping Test Protocol.
- It has passed the Visual Inspection requirements.
- It has passed the Pneumatic Testing requirements
- It has passed the Product Testing requirements.

Verification _____ _____

Date _____

Enclosure (2)

Mechanical Integrity Program

INTRODUCTION

JCI Jones Chemicals is one of the largest repackagers of Chlorine gas and Sulfur Dioxide in the country. These two chemicals are categorized by OSHA and the EPA as Highly Hazardous Chemicals (HHC). Due to the quantities maintained on site at our Branches at any given time, we fall under OSHA's Process Safety Management (PSM) regulations – 29 CFR 1910.119 and the EPA's Risk Management Program (RMP) - 40 CFR Part 68. It should be noted that both of these programs are mandatory programs administered separately by OSHA and the EPA. One of the (14) sections of the PSM Program is Mechanical Integrity; specifically 29 CFR 1910.119 (j). It is important to keep in mind that while Process Safety Management is only mandatory for HHC, JCI has taken the proactive approach of adopting in principal the Mechanical Integrity section of this program for all Branch production and infrastructure systems.

The JCI Mechanical Integrity Program is broken down into five parts. These parts are as follows: Preventative Maintenance, System Inspections, Equipment - History Files, Training, and Repair Parts. Once set up, this program should not take a Manager more than two hours per month to administer and maintain. The purpose of this program is to take a proactive approach to preventative maintenance and inspections to prevent unscheduled down time and costly repairs after the fact. This program will assist you in the management of your maintenance department and in the efficient running of the Plant. JCI will conduct internal audits on a random basis to ensure Branch compliance and will assist in training of Plant personnel. This program should be covered with the maintenance department, Plant Manager, and key Plant personnel.

Preventative Maintenance System
The backbone of the Mechanical Integrity Program is the Preventative Maintenance System. The Preventative Maintenance System (PMS) is a program that maintains current systems and equipment. The required PMS inspections, tests or services to be completed are based on manufacturer's recommendations in conjunction with generally accepted good engineering practices and prior operating experiences. PMS inspections can be performed on a single piece of equipment (i.e. bleach pump) or on individual components of a larger system (i.e. valves in a chlorine system). The PMS program is designed to schedule, perform, and document preventative maintenance on all HHC systems and associated equipment.

System Inspections
System Inspections are designed to inspect and document the results on an entire system; i.e., the Sulfur Dioxide System. The purpose of this inspection is to check all components of a specific system that may otherwise not be covered under general preventative maintenance. System Inspections are based on manufacturer's recommendations in conjunction with generally accepted good engineering practices and prior operating experiences. While it is clear that there are similarities between the Branches with respect to operating systems; i.e., Chlorine (HHC),

Caustic, Bleach, Air, and Mitigation Systems, the systems being inspected and tested at each JCI facility are in fact, Branch specific

Sulfur Dioxide and Sodium Bisulfite operations are not conducted at all facilities...thus again, the program must be specifically tailored to the Branch. System Inspections particularly related to HHC are mandatory and must be completed annually unless otherwise specified.

Equipment History

The 'Equipment History File' is a chronological summary of work performed on a specific piece of equipment and or system. Blank forms have been provided to assist in the setup of the files. Each piece of equipment (i.e.: pump, heat exchanger, etc) should have its own 'history' file. The equipment's history should be kept on file (electronic or paper) along with other pertinent data specific to that piece of equipment. Data for the top portion of the form should be filled out directly from the data plates on the equipment itself. This will assist you in buying repair parts and or obtaining technical manuals on the equipment. As work is performed on the equipment, the "equipment history" should be updated to show a chronological list of work completed. General *monthly, weekly or daily* routine maintenance does not have to be recorded, as the preventative maintenance files will cover this type work. All routine maintenance performed quarterly or above must be documented in the history files. Repairs or upgrades to specific equipment listed must be logged.

Training

Only trained personnel should attempt to perform maintenance on or system inspections of HHC equipment and systems. In addition to basic Plant training on how HHC are processed, specific maintenance training requirements have been developed and implemented to aid in the administration of this program. This training includes but is not limited to: SOP for Maintenance of Equipment, SOP for Annual Inspections of Equipment, The Mechanical Integrity Program, Line Breaking Procedures, Confined Space Entry, Hot Work and Lock out / Tag out. This training is to be conducted and documented annually.

Repair Parts

Systems that come in contact with a HHC have very explicit specifications for repair and maintenance parts. It is extremely important to ensure that all repair and or maintenance parts ordered for use in our HHC systems meet industry standards as outlined both in the manuals and documents referenced in JCI's 'Design Codes, Engineering Standards, and Practices (PR II 61-65) and in the 'cut' sheets found in the Process Safety Information section of the Branch's Process Safety Management files. Most importantly, it is critical that the individual ordering the parts and equipment, and in most cases, the maintenance man, visually inspects the parts and equipment once they are received at the Branch to ensure that they are in fact the parts and equipment ordered.

Summary

A Mechanical Integrity Program is an important part of Branch operations. This program is a management tool developed to ensure continuous Branch operations in a safe and cost effective manner and as such, it is the responsibility of the Branch Manager to ensure all procedures and policies established by this programs are followed to the extent intended. In the case of Highly Hazardous Chemicals, compliance is required by law. Full attention to this program is expected and required.

System Inspections

System Inspections are an integral part of our overall Mechanical Integrity Program. System Inspections are inspections of an entire system, such as the chlorine system, as opposed to inspections of individual pieces of equipment such as a compressor.

The "System Inspection" is designed to verify and document that a system meets established industry standards thereby ensuring safe and efficient operation. JCI uses the Chlorine Institute's Pamphlet #6 (Chlorine Systems for Dry Chlorine) as its primary Industry Reference.

The "System Inspection" is designed to cover all major components and associated parts of the system being inspected. The person conducting the inspection must document the condition of the system being inspected and note any system deficiencies that have been identified. The inspector must make general comments on the entire systems condition, sign and date the inspection. Management will utilize inspection results to prioritize maintenance assignments, evaluate the overall condition of the system, and establish a projected correction dates. All corrections will be documented upon completion.

Note: In accordance with JCI's 'Line Breaking Procedures', any system connected by or to piping must be purged of all pressure and chemical hazards prior to beginning any piping inspection. Sources of product or energy must be locked out in accordance with JCI's policy and procedures.

Following are the procedures to be used in conducting the System Inspections:

Internal Piping:

Once the piping to be inspected has been relieved of all pressure and purged of all chemical hazards, the internal inspection can begin. The internal inspection involves the breaking of lines and a visual inspection of the inside of the piping system. The piping system is to be inspected for the following:

Compressed Gases

Chlorine / Sulfur Dioxide / Air

- ✓ Moisture or Wetness – The internal piping should be clean and dry. Moisture mixed with Chlorine or Sulfur Dioxide forms very strong acids that will attack the piping itself. Particular attention should be paid to blow and vacuum lines. If moisture or wetness is present, the system must be cleaned and properly dried.
- ✓ Solids Buildup – The pipeline should be free of any solids buildup. Solids buildup can result in blockage throughout the piping system. This both reduces system efficiency and creates a potential safety hazard. Particular attention should be paid to any areas in the pipelines having multiple elbows, tees or valves in series. Another area to pay particular attention to is the piping leading into "blow" or "vacuum" tons and areas in which pipeline size has been reduced. If solids buildup is present, the system must be cleaned

and properly dried. If cleaning does not clear the line of solids buildup the line must be replaced.

- ✓ Pipeline Inspection and Testing – Pipeline integrity will be assured by a combination of visual inspections and pneumatic testing. Visual inspections will be conducted at predetermined points in the system. Upon successful completion of the visual inspections the entire pipe system will undergo pneumatic testing. All visual inspection and testing protocol will be completed in accordance with Appendix D in this manual.

Liquid Pipelines

Caustic / Bleach / Bisulfite

- ✓ Solids Buildup – Due to the nature of the liquid products we handle at JCI Branches, the pipeline should remain free of solids buildup. Solids buildup can result in blockage in the piping system. Pay particular attention to piping leading to eductors and heat exchangers. If a buildup of salts is found the system must be cleaned. It is acceptable to clean isolated sections of a liquid piping system.

External Piping

The external pipe inspection is an inspection of the piping exterior. Piping is to be inspected for the following:

- ✓ Deformities in the Piping or Fittings - Piping and fittings should be inspected for signs of excessive wear, tear and excessive corrosion or pitting. Particular attention should be given to rail car hookup nipples and any area where the system is disassembled on a routine basis. If the piping or fittings show any signs of excessive ware, tear, corrosion or pitting, then it must be replaced. Plastic piping and fittings that appears to be light grey or white in appearance must be carefully examined for sign of fatigue or stress cracking.
- ✓ Deformed Piping from Overheating – Pipelines should be properly supported to prevent sections from sagging. Attention should be given to long runs of plastic pipe (PVC, CPVC). Sagging pipe is an indication that the pipe has either been weakened due to excessive product temperature and or is inadequately supported. Sagging pipe should be replaced.
- ✓ Leaks – Most leaks in a piping system are easily detected. Excessive buildups of salts on the outsides of caustic, bleach or bisulfite lines are indications of a small leak. Leaks need to be repaired immediately.

Piping Support

All piping is to be properly supported and secured. Supports should be properly bolted or welded to a permanent structure such as a wall. "Unistrut" is to be used whenever possible and properly secured with piping "unistrut clamps." Clevis hangers can also be used for pipe support. Pay particular attention to unistrut clamps. Ensure pipe clamps used are for piping as opposed to electrical conduit clamps and properly sized. Piping hangers that are found to be in a state of disrepair need to be replaced or repaired. At no time is common

electrical wire, pipe strapping, rope or wood knee braces authorized to support chemical piping systems.

Painting

All Plant piping needs to be properly painted. The piping is to be painted in accordance with the JCI color-coding system as outlined in EN - XXXV. Painting is an ongoing process and needs regular attention.

Labeling

All piping, tanks, pumps, heat exchangers and valves need to be properly labeled. Piping should be labeled with the product as well as an arrow indicating the direction of flow of the product. Any labels found in disrepair need to be changed. All labeling should be in accordance with the JCI labeling program. (EN – XXXV)

Manual Valves

All manual valves on a system must be in proper working order and functioning properly. All valves should be examined for:

- ✓ Stem Leakage – The valve should not have any leakage through the stem packing. If the packing is found to be leaking, the packing should be tightened or the valve replaced.
- ✓ Proper Operation – The valve should open and close properly. All manual valves should be inspected on a regular basis; especially valves not used on a routine basis such as "service" or redundant type valves. If the valve does not operate properly, it should be repaired or replaced.
- ✓ Properly Fitting Handle – The valve handle should fit properly and be tightened to an appropriate level. Particular attention should be paid to valves with stamped handles such as the "JB Clincher Valve" which tends to "hourglass" over time. Broken or worn out handles should be replaced.

Actuated Valves

All actuated valves on a system must be in proper working order and functioning correctly. The valve should be examined for:

- ✓ Stem Leakage – The valve should not have any leakage through the stem packing. If the packing is found to be leaking, the packing should be tightened or the valve replaced.
- ✓ Proper Operation – The valve should open and close properly. All actuated valves should be operated on a regular basis, especially redundant type valves. If the valve does not operate properly, it should be repaired or replaced. Particular attention should be paid to the air open / spring close valves as they are typically used as "emergency" type valves throughout our Plants.
- ✓ Actuator – The valve actuator should be free of excessive corrosion. The actuator should not have any air leakage and the air supply must be dry and free of rust or dirt. Air leaks should be repaired. Actuators with excessive corrosion should be replaced.

- ✓ Solenoids – The solenoid must work properly. The solenoid unit must be free of corrosion and the electrical wires must not be exposed to a corrosive atmosphere. Any solenoid not working properly should be replaced.
- ✓ Linkage – Ensure the linkage between the actuator and the valve is aligned properly and secure. Realign or properly secure the linkage as necessary.

Check Valves

Check Valves are used to ensure product is flowing one way and that it cannot back up into a particular system. (i.e., bleach machine,) The check valves used at JCI are primarily Ball Check or Swing Check Valves. In either case, the check valve must be examined to ensure the swing or ball has free movement and that they properly seal. This can normally be accomplished by disassembling the check valve or removing its inspection plate. Check valves that fail to seal off product should be repaired or replaced.

Tubing

Tubing should be inspected for cracking, flat spots, and or deformities. Tubing should be dry and free of moisture. Securing fittings should be in good shape with no detectible air leaks. Replace any tubing or fittings that are not in pristine shape.

Gauges

Gauges should function correctly and be accurate. The gauges should be checked for damage and calibration. Chlorine gauges and sulfur dioxide gauges should have protective diaphragms between the gauge and the product. Damaged gauges or those that are "out of calibration" need to be recalibrated or replaced.

Whips

Product transfer whips should be inspected for whip integrity. The whip should be free of kinks, flat spots, frayed or chafe guard, and leaks. Whips cannot be repaired and must be replaced if any damage is found. In accordance with established JCI policy all whips to include railcar and station whips are to be replaced every two years.

Expansion Chamber

The chlorine and sulfur dioxide expansion chambers are designed to relieve excessive pressure on the chlorine or sulfur dioxide systems. The expansion chamber must be checked for the following:

- ✓ Security – The expansion chamber should be properly secured. Re-secure if found to be loose.
- ✓ Gauge – (Follow gauge inspection procedures.)
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Rupture Disc – Read the gauge prior to degassing the system. If the gauge shows any pressure, then the rupture disc has been ruptured and must be replaced.

Vacuum Ton

The vacuum ton is designed to provide an additional volume of vacuum. The vacuum ton must be checked for the following:

- ✓ Security – The vacuum ton should be properly secured. Re-secure if found to be loose.
- ✓ Gauge – (Follow gauge inspection procedures.)
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Ton Container – After ensuring the ton container is empty, an internal inspection should be completed using a fiber optic light. (The inspection should follow the same procedure as an internal inspection of piping.)
- ✓ Actuated Valve – (Follow actuated valve inspection procedures.)
- ✓ Pressure Switch – The pressure switch should be checked for accuracy and electrical corrosion. The switch should be checked using a known pressure source, such as nitrogen, for proper performance. If the pressure switch does not function correctly, it should be repaired or replaced.

Blow Ton

The blow ton is designed to allow liquid chlorine or sulfur dioxide to turn to gas prior to entering the manufacturing vats. The blow ton must be checked for the following:

- ✓ Security – The blow ton should be properly secured. Re-secure if found to be loose.
- ✓ Gauge – (Follow gauge inspection procedures.)
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Ton Container – After ensuring the ton container is empty, an internal inspection should be completed using a fiber optic light. (The inspection should follow the same procedure as the internal inspection of piping.)

Sparge Tubes

Sparge Tubes are used to inject a compressed gas (Chlorine, Sulfur Dioxide or Air) to the bottom of a vat. Sparge tubes should be removed from a vat and inspected for stress crack and weak points. The sparge tube should be long enough to come within 12 – 20 inches of the bottom of a manufacturing vat. Particular attention should be given to the threaded connection to ensure the threads are good.

Pumps

Pumps need to operate safely and efficiently. All pumps should be checked for the following:

- ✓ Leakage – There should not be any leakage on a pump with the exception of those pumps that have packing designed to drip. In this case, the leakage should be in accordance with the manufacturer's recommendations. Leaks should be repaired as soon as possible.
- ✓ Vibration – All pumps should be properly secured to prevent unnecessary vibration, which can lead to strain on surrounding pipelines. In addition to ensuring pumps are properly secured, shims can be used to correct vibration problems.

- ✓ Knocking – Pumps should not have a "knocking" sound, which is an indication of bad bearings or unbalanced shaft drift. If found knocking, the pump should be taken out of service and the bearing and or shaft should be repaired or replaced.
- ✓ Packing – Packing on all pumps should be free from leaks. The new packing glands have both air and water supplied to them. The water in the seal flush tank should be drained and cleaned. The packing face should normally be replaced every 18 months. If found leaking, the packing must be repaired or replaced.
- ✓ Coupling Alignment – The pump coupling has to be aligned correctly to prevent excessive wear to the bearings and shaft. If the coupling is misaligned, it must be realigned.
- ✓ Amperage – The pump should not exceed the amperage stamped on the motor. To check the amperage, the electrical cover (peckerhead) is to be removed and each motor lead is to be checked for proper amperage. Excessive high amperage is a sign of a problem and can lead to further problems. If excessive amperage draw is discovered, the motor should be shut down and checked for bearing problems, shaft wear, and misalignment of the coupling or blockage in the pump. If any of these conditions are found, the pump must be repaired or replaced.

Eductors

Eductors are used to create a vacuum for the chlorine and sulfur dioxide systems. The eductor should be free of leaks and create sufficient vacuum. The eductor should be pulled, cleaned and reinstalled if it is determined to be malfunctioning.

Heat Exchangers

Heat Exchangers are used to cool the bleach or bisulfite process during manufacturing. The heat exchangers need to be checked for the following:

- ✓ Leaks – Heat exchangers should not leak. Once the system is drained, the heat exchanger should be disconnected and pressure tested with 30 psi of air to ensure there are no internal or external leaks. All leaks should be repaired prior to the unit being reinstalled. Internal heat exchanger leaks can cause damage to the cooling system and or the heat exchanger itself.
- ✓ Gauges – (Follow gauge inspection procedures) Gauges should be mounted on 'water in', 'water out', 'product in', and 'product out feed lines to the heat exchangers.
- ✓ Blockage – Significant pressure drops across the heat exchanger are an indication of blockage. If the exchanger is blocked, it must be disassembled, cleaned and rebuilt.
- ✓ Secured - The heat exchanger should be properly secured. If found to be loose, it should be properly secured.

Tanks

There are three kinds of tanks used at the Branches: FRP, Poly and Steel. Tanks need to be checked for the following:

- ✓ Leaks - The tanks should be free of leaks. If a leak is discovered on a tank, it must be repaired or the tank must be replaced. Particular attention should be paid to the discharge flange bolt holes on poly tanks as they can develop stress cracks on or near bolt holes.
- ✓ Vents – All tanks must be vented. Tanks that do not have an open top must have "U vents" on them. Ensure the tank is properly vented to prevent implosion.
- ✓ Internal Inspection – Tanks should be internally inspected annually. This does not necessarily mean that the tank must be entered. The tank is internally examined for contaminates and tank integrity. Pay particular attention to the FRP tanks for fiberglass degradation. If a tank is determined to be contaminated or its integrity is found to be suspect, it must be taken out of service until cleaned, repaired and or replaced. If the tank must be entered to be inspected or cleaned, you must follow 'Permit Required Confined Space Entry' procedures as outlined in SF II.
- ✓ External Inspection – All tanks are to be examined for excessive corrosion, deformities or any signs of deterioration. Pay particular attention to steel tanks that are exposed to water and weather. Tanks found to have excessive corrosion, deformities, or unacceptable deterioration (wear and tear) must be taken out of service until repaired or replaced.

Expansion Joints

Expansion joints are installed between the tank and the pump. Expansion joints absorb the vibrations of the pump, which would otherwise shake the tank's discharge fittings. Expansion joints are to be kept free of leaks. If a leak is found on an expansion joint, the expansion joint must be repaired or replaced. The expansion joint has a pre-set expansion limit that must not be exceeded. If the pre-set limit has been exceeded, the expansion joint must be repaired or replaced.

Electrical Connections

All electrical connections should be tight, covered, and sealed. In the event, any are found to be loose and uncovered, repair or replace as necessary.

Control Panel

There are many types of control panels at our facilities. They are used on the bleach machine and on almost every mitigation system the Branch uses as an example, the quadscan. Control panels should be checked for the following:

- ✓ Closed and Sealed – All control panels need to be closed and free of fugitive fumes. They should be clean and free of dirt and dust.
- ✓ Labeled – Control panels should be properly labeled to include alarms, buttons, switches, and lights.
- ✓ Buttons and or Switches – Buttons or switches should be tight and proper secured to the control panel. The button or switch should move freely as designed.
- ✓ Panel Lights – Panel lights should all work. Lights that are burned out should be replaced.
- ✓ Electrical Connections – Panel electrical connections should be tight and have conduit or other electrical connection methods of ensuring an air tight connection.

- ✓ Extra Penetrations – Any unused penetrations in the box or door must be properly blanked off. Tape is not authorized.

Function Test

Test the system under normal operating conditions to ensure all equipment is working within the established parameters as designed. Any portion of equipment not working within the designed parameters has be investigated, then repaired or replaced.

Plant Emergency – Stop Button

Plant "E – Stop" buttons are strategically located throughout our facilities and are designed to stop the flow of all chlorine and sulfur dioxide in the building. E – Stop Buttons are to be checked for the following:

- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ E -Stop Button – The scale is also equipped with an E - Stop button. The button is to be pressed and if the actuated valves hooked to the gas detection system fail to close, the button is to be replaced.
- ✓ Alarms – (Follow alarm testing inspection procedures.)
- ✓ Function Test – (Follow function test inspection procedures.)

Alarms

We utilize two types of alarms at the Branches; audio and visual. Audio alarms come in a variety of sounds and tones so that they can be easily identified. Visual are normally yellow and or red rotating flashing lights. Yellow indicates a warning parameter has been reached and red indicates shutdown parameter has been exceeded. Alarms should be checked for the following:

- ✓ Function Test – (Follow function test inspection procedures.)
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Mounting – Audio alarms and visual alarms should be properly mounted to ensure they are secure and free of fugitive fumes.
- ✓ Lights – Lights should work and rotate when activated.
- ✓ Audio Alarms – Audio alarms should be loud enough so that personnel in the immediate area can hear them.

Hoses

Chemical hoses are used to transfer liquid products. Hoses are to be checked for the following:

- ✓ Hose – The hose is to be checked for kinks, splits, flat spots and leaks. The hose should be tested annually at 1½ times its normal working pressure. **Note: Specific hose working pressures can be obtained from the vendor.** Hoses that are damaged should be repaired or replaced.
- ✓ Fittings – Hose fittings should be checked for tightness of the connection. (Banding or Hose Clamps). They should also be checked to ensure the connection is not worn or damaged. Pay particular attention to Poly fittings as they are easily damaged. The

female fitting should have good gaskets in them. Any fitting that needs to be shimmed must be replaced. Any fitting that is not tight must be retightened and any fitting that is worn must be replaced.

Air Dryer

The purpose of the air dryer is to provide dry air to the Plant. Pad air must be – 40 dew point. Plant air should be as close to – 40 dew point, as possible. The air dryer should be checked for the following:

- ✓ Air Leaks - The air dryer should be free of air leaks. All air leaks should be repaired.
- ✓ Air Cycle – The dryer is set on a timer. It should cycle properly and provide dry air. If the cycling is not correct, consult your Tech Manual.
- ✓ Moisture Indicator – The moisture indicator should be blue. If the indicator is pink, the dryer needs to be regenerated.
- ✓ Electrical Connections – Check electrical connections for loose wires. Loose wires should be tightened and kept covered.
- ✓ Desiccant – Desiccant should be changed, at a minimum, every five years.

Demister

The purpose of the demister is to filter out oil that comes off the compressor. The demister separates the oil from the air vapors. The demister is maintenance free. The electric solenoid valve must be checked to ensure it opens and closes when it is supposed to. The solenoid valve is set on a timer that opens and then closes the valve. If the valve does not open and close when it is supposed to, then the valve must be repaired or replaced. The demister will need to be rebuilt on a periodic basis. Consult your tech manual.

Compressor

Compressors are one of the primary infrastructure systems which the entire plant depends on. Without compressed, air we could not operate our facilities. The compressor is annually serviced by outside vendors who specialize in the particular make and model however, the compressor should be checked for the following:

- ✓ Annual Service – Outside vendor
- ✓ Oil and Oil Filter – Check and or change oil.
- ✓ Filters – Check and or change air filter.
- ✓ Aftercooler – Check and clean aftercooler. Remove aftercooler if necessary.
- ✓ Motor – Ensure motor is clean, free of dirt, and properly aligned.
- ✓ Leaks – Check entire compressor system. Ensure there are no leaks of air, oil, water or hydraulic fluid. Repair all leaks. Ensure compressor is clean.

Air Tank

The air tank serves as a receptacle for air. The tank is to be checked for the following:

- ✓ Security – The tank should be secured to the floor to prevent movement. If the tank is not secured to the floor, ensure it is done as soon as possible.
- ✓ Water – The tank should be kept free of excess water.
- ✓ Electric Solenoid Valve - Ensure that the electric solenoid valve opens at the pre-set time. If the solenoid valve does not open at the pre-set time, repair or replace the valve.
- ✓ Pressure Relief Valve – The pressure relief valve is rated for the tank pressure. The relief valve is to be checked with nitrogen at the relief valve pressure. If the relief valve does not open at the pre-set level the valve must be replaced.

Air System - Pre–Filter

The purpose of the air pre–filter is to filter out water or moisture prior to the air dryer. The pre–filter should be checked for air leaks and all air leaks should be repaired. The filter cartridge should be changed when the indicator arrow is in the red or has a pressure differential of more than 5-PSI above the accepted pressure differential across the filter. (Note: A 2-PSI pressure drop, across the filter, equals a 1% horsepower reduction.) Ensure that the electric solenoid valve opens at the pre-set time. If the solenoid valve does not open at the pre-set time, repair or replace the valve.

Air System – After Filter

The purpose of the after filter is to filter out degraded desiccant from inside the air dryer. The after filter should be checked for air leaks and all air leaks should be repaired. The filter cartridge should be changed when the indicator arrow is in the red or has a pressure differential of more than 5-PSI above the accepted pressure differential across the filter. (Note: A 2-PSI pressure drop, across the filter, equals a 1% horsepower reduction.)

Dew Point Indicator

The 'Dew Point Indicator' is designed to read the dew point level in an air piping system. The dew point indicator must be checked for the following:

- ✓ Control Panel – (Follow control panel inspection procedures.)
- ✓ Function Test – (Follow function test inspection procedures.)
- ✓ Probe – Replace dew point probe annually.

ORP/ Temperature or pH / Temperature Probe

The probes are the main component of the Vat Control System. The ORP / Temperature (bleach) probe must be checked to ensure it is properly calibrated. This is done by removing the probe from the tank and checking it in a buffered solution. If any probe is determined to be out of calibration, it must be recalibrated or replaced. The same process is to be used for the pH / Temperature (sodium bisulfite) probe. Probes out of calibration are to be recalibrated or replaced.

Boiler

The Boiler is a critical piece of equipment and particularly for those branches located in the mid-west and northeast. In addition to providing heat for the building(s), it is also used extensively to

provide steam to both caustic railcars and lines to prevent them from freezing up. The boiler is to be inspected and serviced once an outside vender and the following inspections must be conducted by Branch personnel as well.

- ✓ Piping and Piping Supports– (Follow piping and piping supports inspection procedures)
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Pump – (Follow pump inspection procedures.)
- ✓ Tank – (Follow tank inspection procedures.)
- ✓ Hoses – (Follow hose inspection procedures.)
- ✓ Lagging – Insure steam pipes and return lines are properly lagged and insulated.
- ✓ Steam Traps – Ensure steam traps are working correctly. Repair or replace steam traps that are not functioning correctly or broken.

Gas Detection System

The 'Gas Detection System' is designed to detect fugitive emissions and shut down the flow of Highly Hazardous Chemicals into the plant. The Gas Detection System is to be checked for the following:

- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Detection Transmitter - The detection transmitter is to be mounted close to the floor, however, adequate room is to be left for cleaning under the transmitter. Any transmitter that is not properly mounted must be remounted and or relocated.
- ✓ Detection Sensors – The sensors are to be calibrated using a calibration kit. Any sensor determined to be out of calibration should be recalibrated or replaced. (Note: The sensor pucks may need to be changed.)
- ✓ Detection Receiver – The detection receiver must be clean and kept free of fugitive fumes. It must be mounted in such a way that will not be damaged.
- ✓ Electrical Connections – (Follow electrical connection inspections procedures.)
- ✓ Control Panel – (Follow control panel inspection procedures)
- ✓ Alarms – (Follow alarm testing inspection procedure.)
- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Plant E – Stop – (Follow plant E-Stop inspection procedures.)
- ✓ Function Test – (Follow function testing inspection procedures.)

Vat Control System

The 'Vat Control System' is designed to shut down a process vat due to overheating or lack of excess caustic. The system works the same way regardless of whether the vat is processing bleach or sodium bisulfite. The Vat Control System is to be checked for the following:

- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Tubing – (Follow tubing inspection procedures.)
- ✓ ORP / pH Temperature Probe – (Follow ORP / Temperature – pH / Temperature Probe Procedure)

- ✓ Controller – The controller is to be adjusted first to a known strength of product, then to a known temperature to force an alarm and finally to the shutdown parameters to ensure the system is working correctly. Any controller that is not working correctly should be repaired or replaced.
- ✓ E Stop – The E stop should be pressed during operations to ensure it is working correctly. Replace or repair E - Stops that do not shut down the Vat Control System.
- ✓ Control Panel – (Follow control panel inspection procedures.)
- ✓ Alarms – (Follow alarm testing inspection procedures.)
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Function Test – (Follow function test inspection procedures.)

Tank Level Monitoring System

The 'Tank Level Monitoring System' is used to monitor the level of liquid in a tank. High and low level alarms are used to warn when "pre-set" limits have been exceeded. The system must be checked for the following:

- ✓ Control Panel – (Follow control panel inspection procedure.
- ✓ Accuracy – The tank level monitoring system has to be checked to ensure accuracy. This is to be done following the manufacturer's procedures as explained in "Milltronics -Tech Manual" (PL-519 for the SPL Model or PL- 421 for the DPL Model).
- ✓ High Level Alarms – High level alarms can be checked by simply watching the tank fill to the pre-set level or adjusting the high level limits on the leveling unit to a known level in the tank to ensure it will sound the alarm. Any alarm that will not sound when required should be repaired or replaced.
- ✓ Low Level Alarms - Low level alarms can be checked by simply watching the tank empty to the pre-set level or adjusting the low level limits on the leveling unit to a known actual level in the tank to ensure it will sound the alarm. Any alarm that will not sound when required should be repaired or replaced.
- ✓ Transducer – The transducer must be mounted securely in the top of the tank and all electrical connections must be sealed properly to prevent exposure to corrosive atmospheres. Remount and recalibrate the transducer if found to be loose.
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Function Test – (Follow function test inspection procedure.)

Vacuum Alarm System

The 'Vacuum Alarm System' is designed to alert and shut down the vacuum system when loss of vacuum is occurring. The vacuum alarm system is to be checked for the following:

- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Control Panel – (Follow control panel inspection procedure.)
- ✓ Alarms – (Follow alarm testing inspection procedures.)
- ✓ Gauges – (Follow gauge inspection procedures.)
- ✓ Tubing – (Follow tubing inspection procedures.)

- ✓ Pressure Switch – The pressure switch should be tested by applying a known amount of pressure (regulated Nitrogen) and setting the alarm off and forcing a shutdown of the actuated valve. Should the pressure switch fail to respond, it must be recalibrated or replaced.
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Function Test – (Follow function test procedures.)

Scale Shutdown

The 'Scale Shutdown' is designed to prevent the overfilling of containers. The scale shuts off an actuated valve once a pre-set weight has been obtained. This system is to be checked for the following:

- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Tubing – (Follow tubing inspection procedures.)
- ✓ Scale – The scale is to be calibrated and then a known weight is to be placed on the scale to activate the actuated valve. If the valve fails to close, then the scale is to be repaired or replaced.
- ✓ E -Stop Button – The scale is also equipped with an E - Stop button. The button is to be pressed and if the actuated valve fails to close, then the button is to be replaced.
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Function Test – (Follow function test procedures.)

Air Back Flow Prevention System

The "Air Back Flow Prevention System" is designed to shut off the air being supplied to the compressed gas railcars if the pressure on the compressed gas railcars exceeds the pressure on the air compressor. The "Air Back Flow Prevention System" is to be checked for the following:

- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Gauge – (Follow gauge inspection procedures.)
- ✓ Control Panel – (Follow control panel inspection procedure.)
- ✓ Tubing – (Follow tubing insertion procedure.)
- ✓ Pressure Switch – The pressure switch should be tested by applying a known amount of pressure utilizing a regulated nitrogen supply, setting the alarm off and forcing a shutdown of the actuated valve. Should the pressure fail to respond, it must be recalibrated or replaced.
- ✓ Pressure Differential Switch – Apply a known pressure to the downstream side of the pressure differential switch and ensure the actuated valve closes. If the valve does not close, repair or replace the pressure differential switch.
- ✓ Alarms – (Follow alarm testing inspection procedures.)
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Function Test – (Follow function test procedures.)

Railcar Valve Closure System

The 'Railcar Valve Closure System' is designed to shut off the flow of chlorine or sulfur dioxide being supplied from the compressed gas railcars. The system works in conjunction with the Gas Detection System and Plant Panic Buttons to physically close the railcar angle valves when activated. The railcar valve closure system is to be checked for the following:

- ✓ Pneumatic Actuators (Air Motor) -
- ✓ Torque Adaptors – Examine torque adapters (Low and high) for signs of excessive wear. Replace as necessary.
- ✓ Pneumatic Hoses – Examine hoses for splits, cracks, dry rot and deformities. Inspect hose fittings for serviceability. Replace hoes or fittings as needed.
- ✓ Air Hose Brackets and Manifolds – Examine air hose brackets and manifolds for serviceability. Repair or replace as needed.
- ✓ Control Panel – (Follow control panel inspection procedure.)
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)
- ✓ Alarms – (Follow alarm testing inspection procedures.)
- ✓ Air Tanks – (Follow air tank inspection procedures.)
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Actuated Valves – (Follow actuated valve inspection procedures.)
- ✓ Pressure Regulator – Ensure pressure regulator is working correctly.
- ✓ Air Filter – Pull air filter and clean as necessary. Ensure no air leakage.
- ✓ Check Valve – (Follow check valve inspection procedures.)
- ✓ Gauge – (Follow gauge inspection procedures.)
- ✓ Pressure Switch – The pressure switch should be tested by first closing the incoming air supply's manual valve. Slowly bleed off the air from the air tank's drain valve while observing the pressure gauge next to the pressure switch. When the pressure drops to approximately 80 psi, the system should activate.
- ✓ Rotometer- Examine rotometer ensure it is clean and free of moisture and debris. Ensure ball is free flowing.
- ✓ Panic Buttons – (Follow Panic button inspection procedures.)
- ✓ Function Test – (Follow function test procedures.)

Filters

Many of the Branches use filters to filter finished bleach. Bleach filters are to be checked for the following:

- ✓ Leaks - Filters should be free of leaks. If a leak is discovered on the filter, it must be repaired or replaced.
- ✓ Gauge – (Follow gauge inspection procedures.)
- ✓ Filters – If there is a significant pressure drop across the filter; i.e., more than the acceptable 5-PSI, the filters need to be changed. Also examine the filter spool or baskets for deterioration or cracking. Broken filter components must be repaired or replaced.

Scrubbers

Several Branches have scrubbers for bleach or bisulfite fumes. Scrubbers are to be checked for the following:

- ✓ Piping – (Follow piping inspection procedures.)
- ✓ Piping Support – (Follow piping support inspection procedures.)
- ✓ Tank – (Follow tank inspection procedures.)
- ✓ Pump – (Follow pump inspection procedures.)
- ✓ Fan – The fan must be in proper working order for the scrubber to work. The fan should turn freely and be balanced. If the fan is not turning freely or the fan motor bearings are worn out then the fan or fan motor must be replaced.
- ✓ Manual Valves – (Follow manual valve inspection procedures.)
- ✓ Flow Meter - The flow meter measures the flow of caustic recirculation. Pump cavitations or restricted product flow is a sign of salting. If obstructed flow is found, the pump must be cleaned out, repaired or replaced.
- ✓ Electrical connections – (Follow electrical connection inspection procedures.)

Bleach Machine

The bleach machine is a critical piece of equipment not only due to the fact that it is singularly, probably most expensive piece of equipment at any Branch, but also because a properly running machine is vital to the Branch being able to meet its production requirements. Given that the machine, with few exceptions, runs daily, its performance each day should be closely monitored by the employee responsible for operating it. In addition to daily systems checks, the following inspections are to be performed by Branch personnel.

- ✓ Piping – (Follow piping inspection procedures.)
- ✓ Piping Supports – (Follow piping supports inspection procedures.)
- ✓ Tubing – (Follow tubing inspection procedures.)
- ✓ Painting – (Follow painting inspection procedures.)
- ✓ Labeling – (Follow labeling inspection procedures.)
- ✓ Manual Valves – (Follow manual valves inspection procedures.)
- ✓ Actuated Valves – (Follow actuated valves inspection procedures.)
- ✓ Check Valves – (Follow check valves inspection procedures.)
- ✓ Gauges – (Follow gauge inspection procedures.)
- ✓ Pump – (Follow pump inspection procedures.)
- ✓ Heat Exchanger – (Follow heat exchanger inspection procedures.)
- ✓ Tank – (Follow tank inspection procedures.)
- ✓ Air Filter – Air filter should be removed, cleaned or replaced. In addition there should be no air leaks.
- ✓ ORP Probe – (Follow ORP probe inspection procedures.)
- ✓ Reactor – Examine reactor for signs of leakage or deterioration of the reactor itself or the associated hardware.

- ✓ Pressure Differential Switch – Apply a known pressure to the downstream side of the pressure differential switch and ensure the actuated valve closes. If the valve does not close, repair or replace the pressure differential switch.
- ✓ Pressure Switch – The pressure switch should be tested by applying a known amount of pressure (regulated Nitrogen) and setting the alarm off and forcing a shutdown of the actuated valve. Should the pressure switch fail to respond, it must be recalibrated or replaced.
- ✓ Control Panel – (Follow control panel inspection procedures.)
- ✓ Alarms – (Follow alarm inspection procedures.)
- ✓ Rotometer- Examine rotometer ensure it is clean and free of moisture and debris. Ensure ball is free flowing.
- ✓ Current to Air Converters – Perform function test. Consult tech manual.
- ✓ Flow Meters – Perform function test. Consult tech manual.
- ✓ DP Cell – Perform function test. Consult tech manual.
- ✓ Radar Level Control - Perform function test. Consult tech manual.
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)

Bleach Filter System

The 'Bleach Machine Filter System' is critical to the ability of the Branch being able to meet the demands of those customers requiring pristine bleach. There are several components comprising this system and following are the inspections to be performed on each of them by Branch personnel:

- ✓ Piping – (Follow piping inspection procedures.)
- ✓ Piping Supports – (Follow piping supports inspection procedures.)
- ✓ Tubing – (Follow tubing inspection procedures.)
- ✓ Painting – (Follow painting inspection procedures.)
- ✓ Labeling – (Follow labeling inspection procedures.)
- ✓ Manual Valves – (Follow manual valves inspection procedures.)
- ✓ Actuated Valves – (Follow actuated valves inspection procedures.)
- ✓ Pressure Relief Valve – Ensure the pressure relief valve is working correctly. Test with pressure source.
- ✓ Gauges – (Follow gauge inspection procedures.)
- ✓ Pump – (Follow pump inspection procedures.)
- ✓ Control Panel – (Follow control panel inspection procedures.)
- ✓ Tank – (Follow tank inspection procedures.)
- ✓ Air Filter – Air filter should be removed, cleaned or replaced. In addition there should be no air leaks.
- ✓ Filter Barrel – Examine the filter barrel for any signs of excessive wear or leakage. In addition, examine all filter plates, spacers, and inner and outer cloths for damages or deterioration. Examine filter shaft for signs of damage or excessive wear. Clean entire filter barrel inside and out.

- ✓ Filter Shaft Motor – Ensure the shaft motor works correctly and has the proper amount of oil. The motor should turn freely and show no signs of binding. Ensure the shaft packing is tight and not leaking.
- ✓ Electrical Connections – (Follow electrical connection inspection procedures.)

Enclosure (4)

System Inspection

MI V 18

System Inspected: Water Backflow Prevention System

This type System Inspection is performed by an outside Company. Please see attached report.

Inspection Company: Blue Sky Landscaping

Address: 1124 valley Ave N.W.
Puyallup, WA 98371

Contact and Phone: 253-845-2222 Randy

Deficiencies Noted	Condition	Remarks	Correction Date
	Good		

Remarks: Tested good

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ken McDonald
Inspection Date: 10-27-11

Inspector:
Re -Inspection Date:

BACKFLOW PREVENTION ASSEMBLY TEST REPORT

BLUE SKY LANDSCAPE SERVICES INC.
1124 VALLEY AVENUE N.W.
PUYALLUP, WA. 98371
(253) 845-2222

FAXED
NOV 2 2 2011
BY: TA

NAME OF PREMISE Jones Chemical Commercial ☒ Residential ☐

SERVICE ADDRESS 1919 Marine Drive CITY Tacoma ZIP 98422

CONTACT PERSON _____ PHONE ( ) _____ FAX ( ) _____

LOCATION OF ASSEMBLY old boiler room

DOWNSTREAM PROCESS chemical DCVA ☐ RPBA ☒ PVBA ☐ OTHER _____

NEW INSTALL ☐ EXISTING ☒ REPLACEMENT ☐ OLD SER. # _____ PROPER INSTALLATION? YES ☒ NO ☐

MAKE OF ASSEMBLY Watts MODEL 909 SERIAL NO. unknown SIZE 2"

	DCVA / (RPBA) CHECK VALVE NO.1	DCVA / (RPBA) CHECK VALVE NO.2	RPBA	PVBA/SVBA AIR INLET
INITIAL TEST PASSED ☒ FAILED ☐	LEAKED ☐ tight PSID	LEAKED ☐ tight PSID	OPENED AT 2.4 PSID #1 CHECK 7.6 PSID AIR GAP OK? ✓	OPENED AT _____ PSID DID NOT OPEN ☐
NEW PARTS AND REPAIRS	CLEAN REPLACE PART ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____	CLEAN REPLACE PART ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____	CLEAN REPLACE PART ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____	CHECK VALVE HELD AT _____ PSID LEAKED ☐ CLEANED ☐ REPAIRED ☐
TEST AFTER REPAIRS PASSED ☐ FAILED ☐	LEAKED ☐ _____ PSID	LEAKED ☐ _____ PSID	OPENED AT ____ PSID #1 CHECK _____ PSID	AIR INLET _____ PSID CHK VALVE _____ PSID

AIR GAP INSPECTION: Required minimum air gap separation provided? Yes ☐ No ☐ LINE PRESSURE 98 PSI

REMARKS: _____

CONFINED SPACE? _____

TESTERS SIGNATURE: Randy Horne CERT. NO. B 4360 DATE 10-27-11

TESTERS NAME PRINTED: RANDY HORNE TESTERS PHONE # (253) 845-2222

REPAIRED BY: _____ DATE _____

FINAL TEST BY: _____ CERT. NO. _____ DATE _____

CALIBRATION DATE 01 / 03 / 11 GAUGE # 1208086? MODEL: MIDWEST 845-5

I certify that this report is accurate, and I have used WAC 246-290-490 approved test methods and test equipment.

System Inspection

MI V 8

System Inspected: Boiler System

This type System Inspection is performed by an outside Company. Please see attached report.

Inspection Company: L & I

Address: 500 Pacific Ave So.
Suite 400
Bremerton, WA. 98337

Contact and Phone: Jerry Shiflett 360-415-4027

Deficiencies Noted	Condition	Remarks	Correction Date
	Good		

Remarks: Passed inspection - waiting for certificate

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ken McDonald
Inspection Date: 11-8-17

Inspector:
Re -Inspection Date:

System Inspection

MI V 12

System Inspected: Railcar Valve Closure System

	Condition	Remarks	Correction Date
Pneumatic Actuators - Std	Good		
Torque Limiting Adapters	Good		
High Torque Adapters	Good		
Pneumatic Actuators - LT	Good		
Air Hose Brackets & Manifolds	Good		
Air Receivers	Good		
ACS Manual Valve	Good		
ACS Actuated Valves	Good		
ACS Pressure Regulator	Good		
ACS Filter	Good		
ACS Check Valve	Good		
ACS Safety Relief Valve	Good		
ACS Pressure Gauge	Good		
ACS Pressure Switch	Good		
ACS Rotometer	Good		
ACS Piping	Good		

Remarks: Just installed - everything new.

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ken McDonald

Inspection Date: 7-

Inspector:

Re -Inspection Date:

System Inspection

MI V 16

System Inspected: Vacuum Alarm System

	Condition	Remarks	Correction Date
Piping (Internal)	Good		
Piping (External)	Good		
Manual Valves	Good		
Actuated Valves	Good		
Gauges	Good		
Tubing	Good		
Pressure Switch	Good		
Electrical Connections	Good		

	Set Point	Remarks	Correction Date
Chlorine	0 PSI		
Sulfur Dioxide	NA		

Remarks: System is in good operating condition.

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ken Mc[illegible]

Inspection Date: 11-22-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 15

System Inspected: Tank Leveling System

	Condition	Remarks	Correction Date
Tanks	Good		
Valve	Good		
Painting	Good		
Labeling	Good		
Expansion Joint	Good		
Accuracy	Good		
High Level Alarms	Good		
Low Level Alarms	Good		
Transducers	Good		
Electrical Connections	Good		

Remarks: System is in good operating condition

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: [signature]

Inspection Date: 10-30-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 10

System Inspected: Chlorine System

	Condition	Remarks	Correction Date
Piping (Internal)	Good		
Piping (External)	Good		
Piping Supports	Fair		
Painting	Fair		
Labeling	Fair		
Manual Valves	Good		
Actuated Valves	Good		
Gauges	Good		
Whips (Station)	Good		
Whips (Railcar)	Good		
Expansion Chamber	NA		
Vacuum Ton	Good		
Blow Tons	Good		
Sparge Tubes	Good		
Gas Detection System	Good	Cl2 spot 2 bad	
Vacuum Alarm System	Good		
Auto Scale Shut Down	Good		
Electrical Connections	Good		

Remarks: Cl2 system is in good overall condition

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: [signature]

Inspection Date: 5-19-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 9

System Inspected: Caustic System

	Condition	Remarks	Correction Date
Piping	Good		
Piping Supports	Good		
Painting	Fair		
Labeling	Fair		
Manual Valves	Good		
Actuated Valves	Good		
Gauges	Good		
Pump	Good		
Heat Exchanger	Good		
Tanks	Good	18% 005.	
Hoses	Good		
Expansion Joints	NA		
Electrical Connections	Good		
Tank Leveling System	Good		
High Level Alarms	Good		
Low Level Alarms	Good		

Remarks: Caustic system is in good condition

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ka Mall

Inspection Date: 5-27-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 17

System Inspected: Vat Control System

	Condition	Remarks	Correction Date
Actuated Valves	Good		
Tubing	Good		
ORP / PH Probes	Good		
Controller	Good		
E - Stop	Good		
Electrical Connections	Good		

	Set Point	Remarks	Correction Date
High Temperature	100°		
High High Temperature	105°		
High ORP	540		
High High ORP	560		
Low pH	NA		
Low Low pH	NA		

Remarks:

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ken McDonald

Inspection Date: 4-29-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 3

System Inspected: Automatic Scale Shutdown System

	Condition	Remarks	Correction Date
Actuated Valves	Good		
Tubing	Good		
Scale Calibration	Good		
Pressure Switch	Good		
E - Stop	Good		
Electrical Connections	Good		

	Scale #	Function Correctly	Correction Date
Chlorine	1	✓	
	2	✓	
	3	✓	
Sulfur Dioxide	1	NA	
	2		
	3		

Remarks: System is in good condition

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: Ka Mshd

Inspection Date: 3-28-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 2

System Inspected: Air System

	Condition	Remarks	Correction Date
Piping (Internal)	Good		
Piping (External)	Good		
Piping Supports	Good		
Painting	Fair		
Labeling	Good		
Manual Valves	Good		
Actuated Valves	Good		
Check Valve	Good		
Gauges	Good		
Whips	Good		
Pre Filter	Good		
After Filter	Good		
Demister			
Air Receiver Tank	Good		
Pressure Relief Valve	Good		
Air Back Flow Preventor	Good		
Dew Point Indicator	Good		
Air Dryer	Good		
Electrical Connections	Good		

Remarks: System is in Good Condition

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: K. McNeil

Inspection Date: 2-18-11

Inspector:

Re -Inspection Date:

System Inspection

MI V 1

System Inspected: Air Backflow Prevention System

	Condition	Remarks	Correction Date
Piping	Good		
Piping Supports	Good		
Painting	Fair		
Labeling	Good		
Manual Valves	Good		
Actuated Valves	Good		
Gauges	Good		
Tubing	Good		
Pressure Switch	Good		
Press. Differential Switch	Good		
Electrical Connections	Good		

Remarks: System is in good condition

I certify that I have conducted the System Inspection in accordance with JCI - Standard Operating Procedures.

Inspector: KenMcDonald

Inspection Date: 1-25-11

Inspector:

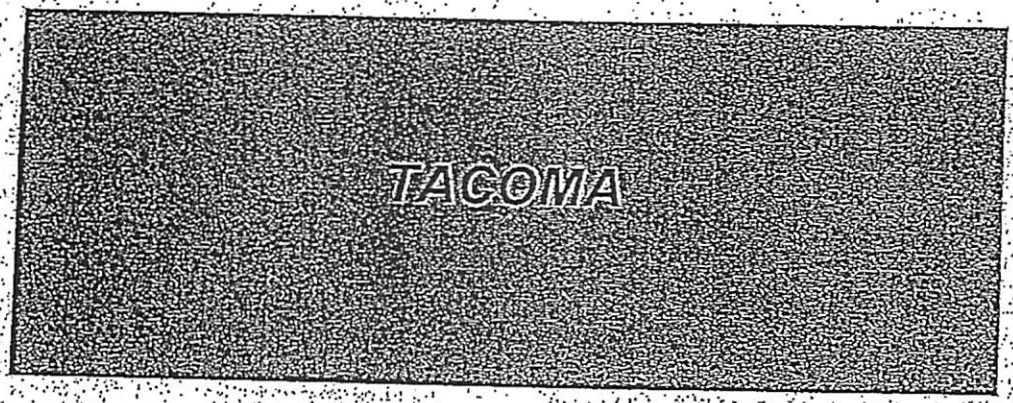
Re -Inspection Date:

Enclosure (5)

MI III - 1

MONTHLY

PREVENTATIVE MAINTENANCE



Month Ending: Sept 2011

Maintenance Person: Ken McDonald

I certify that I have completed all Monthly Preventative Maintenance Checks in accordance with JCI - Standard Operating Procedures.

Ken McDonald

PM - Actuated Valves

Location	Specific Function	Cycled	Air Tubing & Connections	Body or Actuator Bolts	Valve Adapter	Valve Packing
Ton fill # 1	Auto shut off	✓	✓	✓	✓	✓
Ton fill # 2	Auto shut off	✓	✓	✓	✓	✓
Ton fill #3	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 1	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 2	Auto shut off	✓	✓	✓	✓	✓
Cl2 to vats	Mitigation	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - liquid whip	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid whip	✓	✓	✓	✓	✓
Bleach mach.	Block valve	✓	✓	✓	✓	✓
Vacuum tank	Mitigation	✓	✓	✓	✓	✓
Vac. Supply	Isolation for power outage	✓	✓	✓	✓	✓
Vat vac select	Vat 1000	✓	✓	✓	✓	✓
Vat vac select	Vat 2000	✓	✓	✓	✓	✓

PM - Manual Valves

Location	Specific Function	Cycled	Body Bolts	Valve Handle	Valve Packing
Cl2 ton # 1	Process vacuum	✓	✓	✓	✓
Cl2 ton # 1	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 1	Blow gas	✓	✓	✓	✓
Cl2 ton # 1	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 1	Liquid	✓	✓	✓	✓
Cl2 ton # 1	Splitter	✓	✓	✓	✓
Cl2 ton # 2	Process vacuum	✓	✓	✓	✓
Cl2 ton # 2	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 2	Blow gas	✓	✓	✓	✓
Cl2 ton # 2	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 2	Liquid	✓	✓	✓	✓
Cl2 ton # 2	Splitter	✓	✓	✓	✓
Cl2 ton # 3	Process vacuum	✓	✓	✓	✓
Cl2 ton # 3	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 3	Blow gas	✓	✓	✓	✓
Cl2 ton # 3	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 3	Liquid	✓	✓	✓	✓
Cl2 ton # 3	Splitter	✓	✓	✓	✓
Cl2 cyl # 1	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 1	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 1	Liquid	✓	✓	✓	✓
Cl2 cyl # 2	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 2	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 2	Liquid	✓	✓	✓	✓
Hypo vat 1000	Liquid	✓	✓	✓	✓
Hypo vat 2000	Liquid	✓	✓	✓	✓
Hypo vats	Liquid back up	✓	✓	✓	✓
Bleach mach	Liquid	✓	✓	✓	✓

PM - Whips & Transfer Hoses

Location	Specific Function	External Inspection	Excessive Moisture	Railcar Nipples	Flanges or Unions
Cl2 Car # 1	Liquid	✓	NO	✓	✓
Cl2 Car # 1	Air	✓	NO	✓	✓
Cl2 Car # 2	Liquid	✓	NO	✓	✓
Cl2 Car # 2	Air	✓	NO	✓	✓
Cl2 ton # 1	Liquid	✓	✓	N/A	N/A
Cl2 ton # 1	Blow gas	✓	✓	N/A	N/A
Cl2 ton # 2	Liquid	✓	✓	N/A	N/A
Cl2 ton # 2	Blow gas	✓	✓	N/A	N/A
Cl2 ton # 3	Liquid	✓	✓	N/A	N/A
Cl2 ton # 3	Blow gas	✓	✓	N/A	N/A
Cl2 cyl # 1	Liquid	✓	✓	N/A	N/A
Cl2 cyl # 2	Liquid	✓	✓	N/A	N/A
Cl2 ton dump	Blow gas	✓	✓	N/A	N/A
Cl2 ton dump	Blow gas	✓	✓	N/A	N/A
Cl2 ton dump	Blow gas	✓	✓	N/A	N/A
Cl2 ton dump	Blow gas	✓	✓	N/A	N/A
Cl2 cyl dump	Blow gas	✓	✓	N/A	N/A

PM - Gauges

Location	Specific Function	Gauge Type	Diaphragm	External Inspection	Calibration Due
Cl2 car # 1	Liquid pressure	P	✓	✓	
Cl2 car # 1	Air pressure	P	✓	✓	
Cl2 car # 2	Liquid pressure	P	✓	✓	
Cl2 car # 2	Air pressure	P	✓	✓	
Cl2 air	Backflow	P	✓	✓	
Cl2 ton # 1	Liquid pressure	P	✓	✓	
Cl2 ton # 1	Blow gas	P	✓	✓	
Cl2 ton # 1	Vacuum	V	✓	✓	
Cl2 ton # 2	Liquid pressure	P	✓	✓	
Cl2 ton # 2	Blow gas	P	✓	✓	
Cl2 ton # 2	Vacuum	V	✓	✓	
Cl2 ton # 3	Liquid pressure	P	✓	✓	
Cl2 ton # 3	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Liquid pressure	P	✓	✓	
Cl2 cyl. # 1	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Vacuum	V	✓	✓	
Cl2 ton dump	Blow gas	P	✓	✓	
Cl2 cyl. Dump	Blow gas	P	✓	✓	
Cl2 cyl dump	Vacuum	V	✓	✓	
Bleach mach.	Cl2 pressure	P	✓	✓	
Bleach mach.	Caustic pressure	P	✓	✓	
Bleach mach.	water pressure	P	✓	✓	
Bleach mach.	Recycle pressure	P	✓	✓	
Bleach filter	Backwash pressure	P	✓	✓	

PM - Electric Motors

Location	Specific Function	External Inspection	Motor Ventilation	Motor Guard	Excessive Heat	Electrical Connection
Bleach	Bleach circulation pump	✓	✓	✓	✓	✓
Bleach	Vacuum pump	✓	✓	✓	✓	✓
Bleach	Tanker fill pump	✓	✓	✓	✓	✓
Caustic	Caustic circulation pump	✓	✓	✓	✓	✓
Caustic	Bleach machine	✓	✓	✓	✓	✓
Bleach mach.	Recycle	✓	✓	✓	✓	✓
Bleach mach.	Water	✓	✓	✓	✓	✓
Bleach mach.	Cooling water	✓	✓	✓	✓	✓
Chiller	Glycol pump	✓	✓	✓	✓	✓
Chiller	Water pump	✓	✓	✓	✓	✓
Chiller	Heat exchanger pump	✓	✓	✓	✓	✓
E.N.S.	Sump pump	✓	✓	✓	✓	✓
Ton test	Ton test pump	✓	✓	✓	✓	✓
Cooling tower	Bleach machine fan	✓	✓	✓	✓	✓
Cooling tower	Chiller fan	✓	✓	✓	✓	✓
Warehouse	Heater fan - east	✓	✓	✓	✓	✓
Warehouse	Heater fan - west	✓	✓	✓	✓	✓
Bleach filter	Circulation pump	✓	✓	✓	✓	✓
Bleach filter	Backwash drive	✓	✓	✓	✓	✓

PM - Pumps

Location	Specific Function	External Inspection	Pump Coupling	Lubricated	Mechanical Seal
Bleach mach.	Recycle	✓	✓	✓	N/A
Bleach mach.	Caustic	✓	✓	✓	N/A
Bleach mach.	Water	✓	✓	✓	✓
Bleach mach.	Cooling	✓	✓	✓	✓
Tank farm	Caustic	✓	✓	✓	N/A
Tank farm	Vacuum	✓	✓	✓	✓
Tank farm	Bleach circulation	✓	✓	✓	✓
Tank farm	Tanker load	✓	✓	✓	✓
Tank farm	Glycol - heat exchanger	✓	✓	✓	✓
Tank farm	Glycol - chiller	✓	✓	✓	✓
Tank farm	Cooling tower - chiller	✓	✓	✓	✓
Tank farm	Sump pump	✓	N/A	N/A	N/A
Tank farm	Boiler feed	✓	N/A	N/A	N/A
Ton test	Ton test pump	✓	N/A	N/A	N/A

Location	Specific Function		Tank Material	External Inspection	Valve and Flange Bolts	Expansion Joint
Tank farm	Backwash water	JCI 01	XLPE	✓	✓	
Tank farm	Chiller antifreeze	JCI 02	XLPE	✓	✓	NA
Tank farm	Unfiltered bleach	JCI 03	XLPE	✓	✓	
Tank farm	Unfiltered bleach	JCI 04	XLPE	✓	✓	
Tank farm	18% Caustic	JCI 05	STEEL	✓	✓	NA
Tank farm	25% Caustic	JCI 06	STEEL	✓	✓	NA
Tank farm	Bleach reactor vat 1000	JCI 08	XLPE	✓	✓	
Tank farm	Bleach reactor vat 2000	JCI 09	XLPE	✓	✓	
Tank farm	Bleach storage	JCI 10	XLPE	✓	✓	
Tank farm	Bleach storage	JCI 11	XLPE	✓	✓	
Tank farm	Rain storage	JCI 14	XLPE	✓	✓	NA
Tank farm	Waste water	JCI 15	XLPE	✓	✓	NA
Tank farm	Sodium bisulfite	NS 16	XLPE	✓	✓	NA
Tank farm	Bleach storage	JCI 17	XLPE	✓	✓	NA
Tank farm	50% Caustic	NS 18	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 19	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 20	XLPE	✓	✓	NA
Tank farm	Potassium Hydroxide	NS 21	XLPE	✓	✓	NA
Tank farm	Sulfuric acid	NS 22	XLPE	✓	✓	NA
Tank farm	Hydrochloric acid	NS 23	XLPE	✓	✓	NA

PM - Mitigation Equipment

Expansion Chambers

Location	Specific Function	External Inspection	Rupture Disc	Pressure Gauge	Bypass or Blow Off Valves
Blow gas tank	Over pressure protection	✓	✓	✓	NA

Vacuum Alarm System

Location	Internal and External Inspections	All Valves	Tubing	Pressure Switch	System Function Test
Vacuum tank	✓	✓	✓	✓	✓

Vat Control System

Location	System Function Checks	Product	Actuated Valves	Probe Calibration	Electrical Connections
Vat 1000	✓	Bleach	✓	✓	✓
Vat 2000	005	Bleach			

Gas Detection System

Location	System Function Test	Gas	External Inspection	Zero Probe	Electrical Connection
Cl2 cyl. Area		Cl2	✓	✓	✓
Loading dock		Cl2	✓	✓	✓
Cl2 car # 1		Cl2	✓	✓	✓
Cl2 car # 2		Cl2	✓	✓	✓
Bleach vats		Cl2	✓	✓	✓
Bleach machine		Cl2	✓	✓	✓
Boiler room		Cl2	✓	✓	✓
So2 storage		So2	✓	✓	✓

PM - Mitigation Equipment (Additional)

Tank Leveling System

Location	Product	Electrical Connection	High Level Alarm	Low Level Alarm	Inventory Discrepancy
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Bleach vat 1000	✓	✓	✓	
Tank Farm	Bleach vat 2000	✓	✓	✓	
Tank Farm	25% Caustic	✓	✓	✓	
Tank Farm	18% Caustic	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	

Scale Shutdown System

Location	System Function Test	Electrical Connections	Tubing	Actuated Valve	E-Stop Buttons
Cl2 ton # 1	✓	✓	✓	✓	✓
Cl2 ton # 2	✓	✓	✓	✓	✓
Cl2 ton # 3	✓	✓	✓	✓	✓
Cl2 cyl. # 1	✓	✓	✓	✓	✓
Cl2 cyl, # 2	✓	✓	✓	✓	✓

PM - Air System / Air Related Equipment

Air Filters

Location	Specific Function	External Inspection	Air Filter	Pressure Gauge	Bypass or Blow O Valves
Cl2 compressor		✓	✓	✓	✓
Plant compressor		✓	✓	✓	✓

Air Receivers

Location	Specific Function	External Inspection	All Valves	Pressure Gauge	Pressure Relief Valve
Cl2 compressor		✓	✓	✓	✓
plant compressor					

Demister

Location	Specific Function	External Inspection	Catch Can	Pressure Gauge	Bypass or Blow Off Valves

Air Back Flow System

System Function Test	Pressure and Pressure Differential Switches	Air Tubing	Gauges	All Valves	Electrical Connections
✓	✓	✓	✓	✓	✓

ALARM HORNS

Location	Specific Function	External Inspection	Valve	Filter Regulator	Function Test
Bleach machine	✓	✓	NA	NA	✓
Cl2 mitigation		✓	NA	NA	✓
Vacuum alarm		✓	NA	NA	✓
Employee alert		✓	NA	NA	✓

PM - Bleach - Bisulfite Equipment

Cooling Towers

Location	Specific Function	External Inspection	Float Valve	Fan and Fan Motor	Water Distribution Basin
Bleach mach.	Bleach manufacture	✓	✓	✓	✓
Chiller	Bleach vat cooling	✓	✓	✓	✓

Heat Exchangers

Location	Specific Function	External Inspection	Mountings	Pressure Gauges	Temperature Gauges
Bleach. Mach	Caustic cooling	✓	✓	✓	✓
Bleach. Mach	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Caustic tanks	Caustic cooling	✓	✓	✓	✓

Sparge Tubes

Location	Specific Function	External Inspection	Throttle Valve	Excess Movement	

Scrubbers

Location	Specific Function	External Inspection	Internal Inspection	Liquid Flow System	Air Movement System

PM - Bleach Machine- Filters - Filter Press

Bleach Machine

Location	External Inspection of the Bleach Machine	Air Tubing	All Piping	Caustic Valves	Water Valves
B.M. room	✓	✓	✓	✓	✓

Bleach Machine

ORP Probes	Control and Metering Equipment	Reactor	Alarm Tests	Electrical Connections	
✓	✓	✓	✓	✓	

Bleach Filter (Cartridge or Bag)

Location	External Inspection	Internal Inspection	Gauges	Manual Valves	Bag or Cartridge Filter
NA					

Bleach Filter (Powell Filter)

Manual Valves	External Inspection	Electrical Connections	Air Lines	Pressure Relief Valve	Barrel Gear Box
✓	✓	✓	✓	✓	✓

Filter Press

Location	External Inspection	Manual Valves	Hydraulic Press	Filter Plates	Filter Cloth or Gaskets
Mud tank	✓	✓	✓	✓	✓

PM - Handling Equipment

Valve Machine

Location	External Inspection	Amp Meter	Lubricated	Valve Chuck	Electrical Connections
Cl2 cyl. Area	✓	✓	✓	✓	✓

Bead Blaster - Tumbler Blaster

Blast Nozzle and Hoses	External Inspection	Tumbler Basket	Moisture Check	Electrical Connections	Vacuum Cleaner and Dust Bag
NA					

Bead Blaster - Cabinet Blaster

Blast Nozzle and Hoses	External Inspection	Cabinet Glass	Moisture Check	Electrical Connections	Reclaimer and Dust Collector
Valve room	✓	✓	✓	✓	✓

Material Handling Equipment - Carts, Rollers, Ton Lifters, Catwalks, Hoists

Location	Equipment Type	External Inspection	Lubrication	Adjustments	Valves
Loading dock	Bridge Hoist	OOS			
Cl2 ton area	Monorail hoist	✓	✓	✓	NA
Cl2 ton area	Rollers	✓	✓	NA	NA

PM - Hoses

Location	Specific Function	Hose Material	External Inspection	Male Fitting	Female Fitting
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Caustic tanker fill	PVC	✓	✓	✓
Bleach manuf.	Caustic car # 1	RUBBER	✓	✓	✓
Bleach manuf.	Caustic car # 2	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Ton testing	Steam	RUBBER	✓	✓	✓
Ton testing	Air	RUBBER	✓	✓	✓

Lockout / Tagout Log

Month of : Sept. 2011 Branch TACOMA

Item	LO / TO	Applied		Cleared	
		Date	Name	Date	Name
Cooling Tower Water Pump	LO	9-22-11	Ken McDonald	9-23-11	Ken McDonald

LO - Lockout, TO - Tagout

PM - Weekly Water Checks

Branch TACOMA **Month / Year** SEPT. 2011

	Chill Water Tanks	Bleach Machine Cooling Tower	Branch Vat Cooling Tower	Person Conducting Checks
Week # 1	6.8	7.0	7.3	Ken McDonald
Week # 2	6.9	7.2	7.3	K.M.
Week # 3	6.9	7.1	7.2	K M.
Week # 4	6.8	7.1	7.3	KM.
Week # 5				

Please take a water sample from each of the following sources weekly and check the pH of the water.

The purpose of this test is to check for internal heat exchanger leaks.

These weekly checks are to be made with a **HAND HELD** type pH meter **ONLY**.

The Hand Held unit must be calibrated before use. Do not use pH paper.

Do not attempt adjust the pH of the water in the cooling tower or chill water tanks until talking with Environmental Department.

PM - Daily: Pump Mechanical Seal Check

MI III - 17

Month: Sept. 2011

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pump: Bleach Machine-Cooling																															
Seal Leaks	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Water	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Air																															
Pump: Bleach Machine-Caustic																															
Seal Leaks	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Water																															
Seal Air																															
Pump: Bleach Filter																															
Seal Leaks	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Water	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Air																															
Pump: Bleach Tanker Load																															
Seal Leaks	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Water	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Air																															
Pump: Vacuum Pump																															
Seal Leaks	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Water	G	G										G	G						G	G	G	G	G			G	G	G	G	G	
Seal Air																															

G : Good B : Bad

PM - Daily Misc. Equipment Checks

MI III - 18

Branch: TACOMA

Month Of: Sept 2011

Day	Dew Point Indicator Dew Point Reading	Air Drier Desiccant G ~~Pink~~ or ~~Blue~~ R	Air Drier Switching Properly		Water Softener Salt Check		
1	-40	G	✓				
2	-40	G	✓				
3							
4							
5							
6							
7							
8							
9							
10							
11							
12	-40	G	✓				
13	-40	G	✓				
14							
15							
16							
17							
18							
19	-40	G	✓				
20	-40	G	✓				
21	-40	G	✓				
22	-40	G	✓				
23	-40	G	✓				
24							
25							
26	-40	G	✓				
27	-40	G	✓				
28	-40	G	✓				
29	-40	G	✓				
30	-40	G	✓				
31							

PM - Daily Compressor Checks

MI III - 19

Branch: TACOMA **Month:** Sept. 2011

	Primary Compressor			Secondary Compressor		
Date	Oil Level	Leaks	Excessive Noise	Oil Level	Leaks	Excessive Noise
1	✓	NO	NO	✓	NO	NO
2	✓	NO	NO	✓	NO	NO
3						
4						
5						
6						
7						
8						
9						
10						
11						
12	✓	NO	NO	✓	NO	NO
13	✓	NO	NO	✓	NO	NO
14						
15						
16						
17						
18						
19	✓	NO	NO	✓	NO	NO
20	✓	NO	NO	✓	NO	NO
21	✓	NO	NO	✓	NO	NO
22	✓	NO	NO	✓	NO	NO
23	✓	NO	NO	✓	NO	NO
24						
25						
26	✓	NO	NO	✓	NO	NO
27	✓	NO	NO	✓	NO	NO
28	✓	NO	NO	✓	NO	NO
29	✓	NO	NO	✓	NO	NO
30	✓	NO	NO	✓	NO	NO
31						

Comments:

REV 9/27/07

PM - Daily Boiler Checks

MI III - 20

Branch: TACOMA

Month Of: Sept. 2011

Day	Main Blow Down	Surface Blow Down	Low Water Shutoff	H20 Column level	Condensate Return	Water Treatment	Remarks	Inspector
1	✓	✓	✓	✓	✓	✓		K.M.
2	✓	✓	✓	✓	✓	✓		KM.
3								
4								
5								
6								
7								
8								
9								
10								
11								
12	✓	✓	✓	✓	✓	✓		
13	✓	✓	✓	✓	✓	✓		K.M.
14								KM.
15								
16								
17								
18								
19	✓	✓	✓	✓	✓	✓		
20	✓	✓	✓	✓	✓	✓		K.M.
21	✓	✓	✓	✓	✓	✓		K.M.
22	✓	✓	✓	✓	✓	✓		K.M.
23	✓	✓	✓	✓	✓	✓		KM
24								KM
25								
26	✓	✓	✓	✓	✓	✓		
27	✓	✓	✓	✓	✓	✓		K.M.
28	✓	✓	✓	✓	✓	✓		KM.
29	✓	✓	✓	✓	✓	✓		KM.
30	✓	✓	✓	✓	✓	✓		KM.
31								KM.

Enclosure (5)

MI III - 1

MONTHLY

PREVENTATIVE MAINTENANCE

[redacted]

Month Ending: Oct. 2011

Maintenance Person : Ken McDonald

I certify that I have completed all Monthly Preventative Maintenance Checks in accordance with JCI - Standard Operating Procedures.

Ken McDonald

PM - Actuated Valves

MI III -

Location	Specific Function	Cycled	Air Tubing & Connections	Body or Actuator Bolts	Valve Adapter	Valve Packing
Ton fill # 1	Auto shut off	✓	✓	✓	✓	✓
Ton fill # 2	Auto shut off	✓	✓	✓	✓	✓
Ton fill #3	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 1	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 2	Auto shut off	✓	✓	✓	✓	✓
Cl2 to vats	Mitigation	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - liquid whip	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid whip	✓	✓	✓	✓	✓
Bleach mach.	Block valve	✓	✓	✓	✓	✓
Vacuum tank	Mitigation	✓	✓	✓	✓	✓
Vac. Supply	Isolation for power outage	✓	✓	✓	✓	✓
Vat vac select	Vat 1000	✓	✓	✓	✓	✓
Vat vac select	Vat 2000	✓	✓	✓	✓	✓

PM - Manual Valves

Location	Specific Function	Cycled	Body Bolts	Valve Handle	Valve Packing
Cl2 ton # 1	Process vacuum	✓	✓	✓	✓
Cl2 ton # 1	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 1	Blow gas	✓	✓	✓	✓
Cl2 ton # 1	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 1	Liquid	✓	✓	✓	✓
Cl2 ton # 1	Splitter	✓	✓	✓	✓
Cl2 ton # 2	Process vacuum	✓	✓	✓	✓
Cl2 ton # 2	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 2	Blow gas	✓	✓	✓	✓
Cl2 ton # 2	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 2	Liquid	✓	✓	✓	✓
Cl2 ton # 2	Splitter	✓	✓	✓	✓
Cl2 ton # 3	Process vacuum	✓	✓	✓	✓
Cl2 ton # 3	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 3	Blow gas	✓	✓	✓	✓
Cl2 ton # 3	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 3	Liquid	✓	✓	✓	✓
Cl2 ton # 3	Splitter	✓	✓	✓	✓
Cl2 cyl # 1	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 1	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 1	Liquid	✓	✓	✓	✓
Cl2 cyl # 2	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 2	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 2	Liquid	✓	✓	✓	✓
Hypo vat 1000	Liquid	✓	✓	✓	✓
Hypo vat 2000	Liquid	✓	✓	✓	✓
Hypo vats	Liquid back up	✓	✓	✓	✓
Bleach mach	Liquid	✓	✓	✓	✓

PM - Whips & Transfer Hoses

Location	Specific Function	External Inspection	Excessive Moisture	Railcar Nipples	Flanges or Unions
Cl2 Car # 1	Liquid	✓	NO	✓	✓
Cl2 Car # 1	Air	✓	NO	✓	✓
Cl2 Car # 2	Liquid	✓	NO	✓	✓
Cl2 Car # 2	Air	✓	NO	✓	✓
Cl2 ton # 1	Liquid	✓	NO	N/A	N/A
Cl2 ton # 1	Blow gas	✓	NO	N/A	N/A
Cl2 ton # 2	Liquid	✓	NO	N/A	N/A
Cl2 ton # 2	Blow gas	✓	NO	N/A	N/A
Cl2 ton # 3	Liquid	✓	NO	N/A	N/A
Cl2 ton # 3	Blow gas	✓	NO	N/A	N/A
Cl2 cyl # 1	Liquid	✓	NO	N/A	N/A
Cl2 cyl # 2	Liquid	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 cyl dump	Blow gas	✓	NO	N/A	N/A

PM - Gauges

Location	Specific Function	Gauge Type	Diaphragm	External Inspection	Calibration Due
Cl2 car # 1	Liquid pressure	P	✓	✓	
Cl2 car # 1	Air pressure	P	✓	✓	
Cl2 car # 2	Liquid pressure	P	✓	✓	
Cl2 car # 2	Air pressure	P	✓	✓	
Cl2 air	Backflow	P	✓	✓	
Cl2 ton # 1	Liquid pressure	P	✓	✓	
Cl2 ton # 1	Blow gas	P	✓	✓	
Cl2 ton # 1	Vacuum	V	✓	✓	
Cl2 ton # 2	Liquid pressure	P	✓	✓	
Cl2 ton # 2	Blow gas	P	✓	✓	
Cl2 ton # 2	Vacuum	V	✓	✓	
Cl2 ton # 3	Liquid pressure	P	✓	✓	
Cl2 ton # 3	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Liquid pressure	P	✓	✓	
Cl2 cyl. # 1	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Vacuum	V	✓	✓	
Cl2 ton dump	Blow gas	P	✓	✓	
Cl2 cyl. Dump	Blow gas	P	✓	✓	
Cl2 cyl. dump	Vacuum	V	✓	✓	
Bleach mach.	Cl2 pressure	P	✓	✓	
Bleach mach.	Caustic pressure	P	✓	✓	
Bleach mach.	water pressure	P	✓	✓	
Bleach mach.	Recycle pressure	P	✓	✓	
Bleach filter	Backwash pressure	P	✓	✓	

PM - Electric Motors

Location	Specific Function	External Inspection	Motor Ventilation	Motor Guard	Excessive Heat	Electrical Connection
Bleach	Bleach circulation pump	✓	✓	✓	NO	✓
Bleach	Vacuum pump	✓	✓	✓	NO	✓
Bleach	Tanker fill pump	✓	✓	✓	NO	✓
Caustic	Caustic circulation pump	✓	✓	✓	NO	✓
Caustic	Bleach machine	✓	✓	✓	NO	✓
Bleach mach.	Recycle	✓	✓	✓	NO	✓
Bleach mach.	Water	✓	✓	✓	NO	✓
Bleach mach.	Cooling water	✓	✓	✓	NO	✓
Chiller	Glycol pump	✓	✓	✓	NO	✓
Chiller	Water pump	✓	✓	✓	NO	✓
Chiller	Heat exchanger pump	✓	✓	✓	NO	✓
E.N.S.	Sump pump	✓	✓	✓	NO	✓
Ton test	Ton test pump	✓	✓	✓	NO	✓
Cooling tower	Bleach machine fan	✓	✓	✓	NO	✓
Cooling tower	Chiller fan	✓	✓	✓	NO	✓
Warehouse	Heater fan - east	✓	✓	✓	NO	✓
Warehouse	Heater fan - west	✓	✓	✓	NO	✓
Bleach filter	Circulation pump	✓	✓	✓	NO	✓
Bleach filter	Backwash drive	✓	✓	✓	NO	✓

PM - Pumps

Location	Specific Function	External Inspection	Pump Coupling	Lubricated	Mechanical Sea
Bleach mach.	Recycle	✓	✓	✓	✓
Bleach mach.	Caustic	✓	✓	✓	✓
Bleach mach.	Water	✓	✓	✓	✓
Bleach mach.	Cooling	✓	✓	✓	✓
Tank farm	Caustic	✓	✓	✓	✓
Tank farm	Vacuum	✓	✓	✓	✓
Tank farm	Bleach circulation	✓	✓	✓	✓
Tank farm	Tanker load	✓	✓	✓	✓
Tank farm	Glycol - heat exchanger	✓	✓	✓	✓
Tank farm	Glycol - chiller	✓	✓	✓	✓
Tank farm	Cooling tower - chiller	✓	✓	✓	✓
Tank farm	Sump pump	✓	✓	✓	✓
Tank farm	Boiler feed	✓	✓	✓	✓
Ton test	Ton test pump	✓	✓	✓	✓

PM - Tanks

Location	Specific Function		Tank Material	External Inspection	Valve and Flange Bolts	Expansion Joint
Tank farm	Backwash water	JCI 01	XLPE	✓	✓	✓
Tank farm	Chiller antifreeze	JCI 02	XLPE	✓	✓	NA
Tank farm	Unfiltered bleach	JCI 03	XLPE	✓	✓	✓
Tank farm	Unfiltered bleach	JCI 04	XLPE	✓	✓	✓
Tank farm	18% Caustic	JCI 05	STEEL	✓	✓	NA
Tank farm	25% Caustic	JCI 06	STEEL	✓	✓	NA
Tank farm	Bleach reactor vat 1000	JCI 08	XLPE	✓	✓	✓
Tank farm	Bleach reactor vat 2000	JCI 09	XLPE	✓	✓	✓
Tank farm	Bleach storage	JCI 10	XLPE	✓	✓	✓
Tank farm	Bleach storage	JCI 11	XLPE	✓	✓	✓
Tank farm	Rain storage	JCI 14	XLPE	✓	✓	NA
Tank farm	Waste water	JCI 15	XLPE	✓	✓	NA
Tank farm	Sodium bisulfite	NS 16	XLPE	✓	✓	NA
Tank farm	Bleach storage	JCI 17	XLPE	✓	✓	NA
Tank farm	50% Caustic	NS 18	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 19	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 20	XLPE	✓	✓	NA
Tank farm	Potasslum Hydroxide	NS 21	XLPE	✓	✓	NA
Tank farm	Sulfuric acid	NS 22	XLPE	✓	✓	NA
Tank farm	Hydrochloric acid	NS 23	XLPE	✓	✓	NA

PM - Mitigation Equipment

Expansion Chambers

Location	Specific Function	External Inspection	Rupture Disc	Pressure Gauge	Bypass or Blow Off Valves
Blow gas tank	Over pressure protection	✓	✓	✓	NA

Vacuum Alarm System

Location	Internal and External Inspections	All Valves	Tubing	Pressure Switch	System Function Test
Vacuum tank	✓	✓	✓	✓	✓

Vat Control System

Location	System Function Checks	Product	Actuated Valves	Probe Calibration	Electrical Connections
Vat 1000	✓	Bleach	✓		✓
Vat 2000	✓	Bleach	✓		✓

Gas Detection System

Location	System Function Test	Gas	External Inspection	Zero Probe	Electrical Connection
Cl2 cyl. Area	✓	Cl2	✓	✓	✓
Loading dock	✓	Cl2	✓	✓	✓
Cl2 car # 1	✓	Cl2	✓	✓	✓
Cl2 car # 2	✓	Cl2	✓	✓	✓
Bleach vats (WAREHOUSE EAST)	✓	Cl2	✓	✓	✓
~~Bleach machine~~	✓	Cl2	✓	✓	✓
Boiler room	✓	Cl2	✓	✓	✓
So2 storage	✓	So2	✓	✓	✓

PM - Mitigation Equipment (Additional)

MI III - 10

Tank Leveling System

Location	Product	Electrical Connection	High Level Alarm	Low Level Alarm	Inventory Discrepancy
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Bleach vat 1000	✓	✓	✓	
Tank Farm	Bleach vat 2000	✓	✓	✓	
Tank Farm	25% Caustic	✓	✓	✓	
Tank Farm	18% Caustic	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	

Scale Shutdown System

Location	System Function Test	Electrical Connections	Tubing	Actuated Valve	E-Stop Buttons
Cl2 ton # 1	✓	✓	✓	✓	✓
Cl2 ton # 2	✓	✓	✓	✓	✓
Cl2 ton # 3	✓	✓	✓	✓	✓
Cl2 cyl. # 1	✓	✓	✓	✓	✓
Cl2 cyl. # 2	✓	✓	✓	✓	✓

PM - Air System / Air Related Equipment

Air Filters

Location	Specific Function	External Inspection	Air Filter	Pressure Gauge	Bypass or Blow C Valves
Cl2 compressor		✓	✓	✓	✓
Plant compressor		✓	✓	✓	✓

Air Receivers

Location	Specific Function	External Inspection	All Valves	Pressure Gauge	Pressure Relief Valve
Cl2 compressor		✓	✓	✓	✓
plant compressor		✓	✓	✓	✓

Demister

Location	Specific Function	External Inspection	Catch Can	Pressure Gauge	Bypass or Blow Off Valves

Air Back Flow System

System Function Test	Pressure and Pressure Differential Switches	Air Tubing	Gauges	All Valves	Electrical Connections
✓	✓	✓	✓	✓	✓

ALARM HORNS

Location	Specific Function	External Inspection	Valve	Filter Regulator	Function Test
Bleach machine		✓	N/A	N/A	✓
Cl2 mitigation		✓	N/A	N/A	✓
Vacuum alarm		✓	N/A	N/A	✓
Employee alert		✓	N/A	N/A	✓

PM - Bleach - Bisulfite Equipment

Cooling Towers

Location	Specific Function	External Inspection	Float Valve	Fan and Fan Motor	Water Distribution Basin
Bleach mach.	Bleach manufacture	✓	✓	✓	✓
		✓	✓	✓	✓
Chiller	Bleach vat cooling				

Heat Exchangers

Location	Specific Function	External Inspection	Mountings	Pressure Gauges	Temperature Gauges
Bleach. Mach	Caustic cooling	✓	✓	✓	✓
Bleach. Mach	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Caustic tanks	Caustic cooling	✓	✓	✓	✓

Sparge Tubes

Location	Specific Function	External Inspection	Throttle Valve	Excess Movement	

Scrubbers

Location	Specific Function	External Inspection	Internal Inspection	Liquid Flow System	Air Movement System

PM - Bleach Machine- Filters - Filter Press

Bleach Machine

Location	External Inspection of the Bleach Machine	Air Tubing	All Piping	Caustic Valves	Water Valves
B.M. room	✓	✓	✓	✓	✓

Bleach Machine

ORP Probes	Control and Metering Equipment	Reactor	Alarm Tests	Electrical Connections	
✓	✓	✓	✓	✓	

Bleach Filter (Cartridge or Bag)

Location	External Inspection	Internal Inspection	Gauges	Manual Valves	Bag or Cartridge Filter
NA	✓	✓	✓	✓	✓

Bleach Filter (Powell Filter)

Manual Valves	External Inspection	Electrical Connections	Air Lines	Pressure Relief Valve	Barrel Gear Box

Filter Press

Location	External Inspection	Manual Valves	Hydraulic Press	Filter Plates	Filter Cloth or Gaskets
Mud tank	✓	✓	✓	✓	✓

PM - Handling Equipment

Valve Machine

Location	External Inspection	Amp Meter	Lubricated	Valve Chuck	Electrical Connections
Cl2 cyl. Area	✓	✓	✓	✓	✓

Bead Blaster - Tumbler Blaster

Blast Nozzle and Hoses	External Inspection	Tumbler Basket	Moisture Check	Electrical Connections	Vacuum Cleaner and Dust Bag
NA					

Bead Blaster - Cabinet Blaster

Blast Nozzle and Hoses	External Inspection	Cabinet Glass	Moisture Check	Electrical Connections	Reclaimer and Dust Collector
Valve room	✓	✓	✓	✓	✓

Material Handling Equipment - Carts, Rollers, Ton Lifters, Catwalks, Hoists

Location	Equipment Type	External Inspection	Lubrication	Adjustments	Valves
Loading dock	Bridge Hoist	1005			
Cl2 ton area	Monorail hoist	✓	✓	NA	NA
Cl2 ton area	Rollers	✓	✓	NA	NA

PM - Hoses

Location	Specific Function	Hose Material	External Inspection	Male Fitting	Female Fitting
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Caustic tanker fill	PVC	✓	✓	✓
Bleach manuf.	Caustic car # 1	RUBBER	✓	✓	✓
Bleach manuf.	Caustic car # 2	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Ton testing	Steam	RUBBER	✓	✓	✓
Ton testing	Air	RUBBER	✓	✓	✓

PM - Daily: Pump Mechanical Seal Check

MI III - 17

Month: Oct 2011

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pump: Bleach Machine-Cooling																															
Seal Leaks			G	G	G	G	G			G	G	G	G	G			G	G	G	G				G	G	G	G	G			G
Seal Water			G	G	G	G	G			G	G	G	G	G			G	G	G	G				G	G	G	G	G			G
Seal Air																															
Pump: Bleach Machine-Caustic																															
Seal Leaks			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Water																															
Seal Air																															
Pump: Bleach Filter																															
Seal Leaks			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Water			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Air																															
Pump: Bleach Tanker Load																															
Seal Leaks			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Water			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Air																															
Pump: Vacuum Pump																															
Seal Leaks			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Water			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G	G			G
Seal Air																															

G : Good B : Bad

PM - Daily Misc. Equipment Checks

MI III - 18

Branch: TACOMA

Month Of: Oct. 2011

Day	Dew Point Indicator Dew Point Reading	Air Drier Desiccant ~~Pink~~ or Blue G	Air Drier Switching Properly		Water Softener Salt Check		
1							
2							
3	-40	G	✓				
4	-40	G	✓				
5	-40	G	✓				
6	-40	G	✓				
7	-40	G	✓				
8							
9							
10	-40	G	✓				
11	-40	G	✓				
12	-40	G	✓				
13	-40	G	✓				
14	-40	G	✓				
15							
16							
17	-40	G	✓				
18	-40	G	✓				
19	-40	G	✓				
20	-40	G	✓				
21	-40	G	✓				
22							
23							
24	-40	G	✓				
25	-40	G	✓				
26	-40	G	✓				
27	-40	G	✓				
28	-40	G	✓				
29							
30							
31	-40	G	✓				

PM - Daily Compressor Checks

MI III - 19

Branch: TACOMA

Month: Oct. 2011

	Primary Compressor			Secondary Compressor		
Date	Oil Level	Leaks	Excessive Noise	Oil Level	Leaks	Excessive Noise
1	✓					
2						
3	✓	NO	NO	✓	NO	NO
4	✓	NO	NO	✓	NO	NO
5	✓	NO	NO	✓	NO	NO
6	✓	NO	NO	✓	NO	NO
7	✓	NO	NO	✓	NO	NO
8						
9						
10	✓	NO	NO	✓	NO	NO
11	✓	NO	NO	✓	NO	NO
12	✓	NO	NO	✓	NO	NO
13	✓	NO	NO	✓	NO	NO
14	✓	NO	NO	✓	NO	NO
15						
16						
17	✓	NO	NO	✓	NO	NO
18	✓	NO	NO	✓	NO	NO
19	✓	NO	NO	✓	NO	NO
20	✓	NO	NO	✓	NO	NO
21	✓	NO	NO	✓	NO	NO
22						
23						
24	✓	NO	NO	✓	NO	NO
25	✓	NO	NO	✓	NO	NO
26	✓	NO	NO	✓	NO	NO
27	✓	NO	NO	✓	NO	NO
28	✓	NO	NO	✓	NO	NO
29						
30						
31	✓	NO	NO	✓	NO	NO

Comments:

REV 9/27/07

PM - Daily Boiler Checks

MI III - 20

Branch: TACOMA

Month Of: Oct. 2011

Day	Main Blow Down	Surface Blow Down	Low Water Shutoff	H20 Column level	Condensate Return	Water Treatment	Remarks	Inspector
1								
2								
3	✓	✓	✓	✓	✓	✓		K.M.
4	✓	✓	✓	✓	✓	✓		K.M.
5	✓	✓	✓	✓	✓	✓		K.M.
6	✓	✓	✓	✓	✓	✓		K.M.
7								
8								
9								
10	✓	✓	✓	✓	✓	✓		K.M.
11	✓	✓	✓	✓	✓	✓		K.M.
12	✓	✓	✓	✓	✓	✓		K.M.
13	✓	✓	✓	✓	✓	✓		K.M.
14	✓	✓	✓	✓	✓	✓		K.M.
15								
16								
17	✓	✓	✓	✓	✓	✓		K.M.
18	✓	✓	✓	✓	✓	✓		KM.
19	✓	✓	✓	✓	✓	✓		K.M.
20	✓	✓	✓	✓	✓	✓		KM
21	✓	✓	✓	✓	✓	✓		K.M.
22								
23								
24	✓	✓	✓	✓	✓	✓		K.M.
25	✓	✓	✓	✓	✓	✓		K.M.
26	✓	✓	✓	✓	✓	✓		K.M.
27	✓	✓	✓	✓	✓	✓		K.M.
28	✓	✓	✓	✓	✓	✓		K.M.
29								
30								
31	✓	✓	✓	✓	✓	✓		K.M.

PM - Weekly Water Checks

Branch TACOMA

Month / Year Oct. 2011

	Chill Water Tanks	Bleach Machine Cooling Tower	Branch Vat Cooling Tower	Person Conducting Checks
Week # 1	6.8	7.0	7.2	K.M
Week # 2	6.8	6.9	7.2	KM.
Week # 3	6.8	6.9	7.1	KM.
Week # 4	6.9	6.9	7.1	KM.
Week # 5				

Please take a water sample from each of the following sources weekly and check the pH of the water.

The purpose of this test is to check for internal heat exchanger leaks.

These weekly checks are to be made with a **HAND HELD** type pH meter **ONLY.**

The Hand Held unit must be calibrated before use. Do not use pH paper.

Do not attempt adjust the pH of the water in the cooling tower or chill water tanks until talking with Environmental Department.

Lockout / Tagout Log

Month of: October 2011

Branch TACOMA

Did not use

Item	LO / TO	Applied		Cleared	
		Date	Name	Date	Name

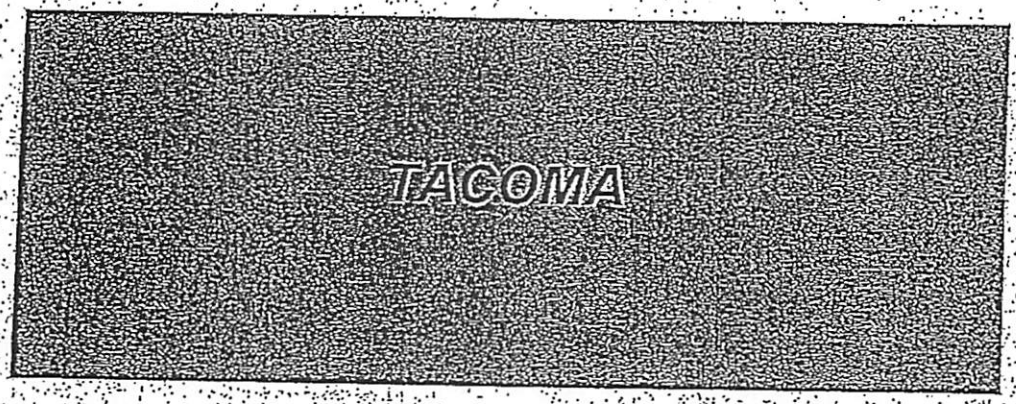
LO - Lockout, TO - Tagout

Enclosure (5)

MI III - 1

MONTHLY

PREVENTATIVE MAINTENANCE



Month Ending: November 2011

Maintenance Person: Ken McDonald

I certify that I have completed all Monthly Preventative Maintenance Checks in accordance with JCI - Standard Operating Procedures.

Ken McDonald

PM - Actuated Valves

MI III -

Location	Specific Function	Cycled	Air Tubing & Connections	Body or Actuator Bolts	Valve Adapter	Valve Packing
Ton fill # 1	Auto shut off	✓	✓	✓	✓	✓
Ton fill # 2	Auto shut off	✓	✓	✓	✓	✓
Ton fill #3	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 1	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 2	Auto shut off	✓	✓	✓	✓	✓
Cl2 to vats	Mitigation	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - liquid whip	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid whip	✓	✓	✓	✓	✓
Bleach mach.	Block valve	✓	✓	✓	✓	✓
Vacuum tank	Mitigation	✓	✓	✓	✓	✓
Vac. Supply	Isolation for power outage	✓	✓	✓	✓	✓
Vat vac select	Vat 1000	✓	✓	✓	✓	✓
Vat vac select	Vat 2000	✓	✓	✓	✓	✓

PM - Manual Valves

Location	Specific Function	Cycled	Body Bolts	Valve Handle	Valve Packing
Cl2 ton # 1	Process vacuum	✓	✓	✓	✓
Cl2 ton # 1	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 1	Blow gas	✓	✓	✓	✓
Cl2 ton # 1	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 1	Liquid	✓	✓	✓	✓
Cl2 ton # 1	Splitter	✓	✓	✓	✓
Cl2 ton # 2	Process vacuum	✓	✓	✓	✓
Cl2 ton # 2	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 2	Blow gas	✓	✓	✓	✓
Cl2 ton # 2	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 2	Liquid	✓	✓	✓	✓
Cl2 ton # 2	Splitter	✓	✓	✓	✓
Cl2 ton # 3	Process vacuum	✓	✓	✓	✓
Cl2 ton # 3	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 3	Blow gas	✓	✓	✓	✓
Cl2 ton # 3	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 3	Liquid	✓	✓	✓	✓
Cl2 ton # 3	Splitter	✓	✓	✓	✓
Cl2 cyl # 1	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 1	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 1	Liquid	✓	✓	✓	✓
Cl2 cyl # 2	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 2	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 2	Liquid	✓	✓	✓	✓
Hypo vat 1000	Liquid	✓	✓	✓	✓
Hypo vat 2000	Liquid	✓	✓	✓	✓
Hypo vats	Liquid back up	✓	✓	✓	✓
Bleach mach	Liquid	✓	✓	✓	✓

PM - Whips & Transfer Hoses

Location	Specific Function	External Inspection	Excessive Moisture	Railcar Nipples	Flanges or Unions
Cl2 Car # 1	Liquid	✓	NO	✓	✓
Cl2 Car # 1	Air	✓	NO	✓	✓
Cl2 Car # 2	Liquid	✓	NO	✓	✓
Cl2 Car # 2	Air	✓	NO	✓	✓
Cl2 ton # 1	Liquid	✓	NO	N/A	N/A
Cl2 ton # 1	Blow gas	✓	NO	N/A	N/A
Cl2 ton # 2	Liquid	✓	NO	N/A	N/A
Cl2 ton # 2	Blow gas	✓	NO	N/A	N/A
Cl2 ton # 3	Liquid	✓	NO	N/A	N/A
Cl2 ton # 3	Blow gas	✓	NO	N/A	N/A
Cl2 cyl # 1	Liquid	✓	NO	N/A	N/A
Cl2 cyl # 2	Liquid	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 cyl dump	Blow gas	✓	NO	N/A	N/A

PM - Gauges

Location	Specific Function	Gauge Type	Diaphragm	External Inspection	Calibration Due
Cl2 car # 1	Liquid pressure	P	✓	✓	
Cl2 car # 1	Air pressure	P	✓	✓	
Cl2 car # 2	Liquid pressure	P	✓	✓	
Cl2 car # 2	Air pressure	P	✓	✓	
Cl2 air	Backflow	P	✓	✓	
Cl2 ton # 1	Liquid pressure	P	✓	✓	
Cl2 ton # 1	Blow gas	P	✓	✓	
Cl2 ton # 1	Vacuum	V	✓	✓	
Cl2 ton #.2	Liquid pressure.	P	✓	✓	
Cl2 ton # 2	Blow gas.	P	✓	✓	
Cl2 ton # 2	Vacuum	V	✓	✓	
Cl2 ton # 3	Liquid pressure	P	✓	✓	
Cl2 ton # 3	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Liquid pressure	P	✓	✓	
Cl2 cyl. # 1	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Vacuum	V	✓	✓	
Cl2 ton dump	Blow gas	P	✓	✓	
Cl2 cyl. Dump	Blow gas	P	✓	✓	
Cl2 cyl dump	Vacuum	V	✓	✓	
Bleach mach.	Cl2 pressure	P	✓	✓	
Bleach mach.	Caustic pressure	P	✓	✓	
Bleach mach.	water pressure	P	✓	✓	
Bleach mach.	Recycle pressure	P	✓	✓	
Bleach filter	Backwash pressure	P	✓	✓	

PM - Electric Motors

Location	Specific Function	External Inspection	Motor Ventilation	Motor Guard	Excessive Heat	Electrical Connectio
Bleach	Bleach circulation pump	✓	✓	✓	NO	✓
Bleach	Vacuum pump	✓	✓	✓	NO	✓
Bleach	Tanker fill pump	✓	✓	✓	NO	✓
Caustic	Caustic circulation pump	✓	✓	✓	NO	✓
Caustic	Bleach machine	✓	✓	✓	NO	✓
Bleach mach.	Recycle	✓	✓	✓	NO	✓
Bleach mach.	Water	✓	✓	✓	NO	✓
Bleach mach.	Cooling water	✓	✓	✓	NO	✓
Chiller	Glycol pump	✓	✓	✓	NO	✓
Chiller	Water pump	✓	✓	✓	NO	✓
Chiller	Heat exchanger pump	✓	✓	✓	NO	✓
E.N.S.	Sump pump	✓	✓	✓	NO	✓
Ton test	Ton test pump	✓	✓	✓	NO	✓
Cooling tower	Bleach machine fan	✓	✓	✓	NO	✓
Cooling tower	Chiller fan	✓	✓	✓	NO	✓
Warehouse	Heater fan - east	✓	✓	✓	NO	✓
Warehouse	Heater fan - west	✓	✓	✓	NO	✓
Bleach filter	Circulation pump	✓	✓	✓	NO	✓
Bleach filter	Backwash drive	✓	✓	✓	NO	✓

PM - Pumps

Location	Specific Function	External Inspection	Pump Coupling	Lubricated	Mechanical Sea
Bleach mach.	Recycle	✓	✓	✓	✓
Bleach mach.	Caustic	✓	✓	✓	✓
Bleach mach.	Water	✓	✓	✓	✓
Bleach mach.	Cooling	✓	✓	✓	✓
Tank farm	Caustic	✓	✓	✓	✓
Tank farm	Vacuum	✓	✓	✓	✓
Tank farm	Bleach circulation	✓	✓		✓
Tank farm	Tanker load	✓	✓	✓	✓
Tank farm	Glycol - heat exchanger	✓	✓	✓	✓
Tank farm	Glycol - chiller	✓	✓	✓	✓
Tank farm	Cooling tower - chiller	✓	✓	✓	✓
Tank farm	Sump pump	✓	✓	✓	✓
Tank farm	Boiler feed	✓	✓	✓	✓
Ton test	Ton test pump	✓	✓	✓	✓

Location	Specific Function		Tank Material	External Inspection	Valve and Flange Bolts	Expansion / Joint
Tank farm	Backwash water	JCI 01	XLPE	✓	✓	✓
Tank farm	Chiller antifreeze	JCI 02	XLPE	✓	✓	NA
Tank farm	Unfiltered bleach	JCI 03	XLPE	✓	✓	✓
Tank farm	Unfiltered bleach	JCI 04	XLPE	✓	✓	✓
Tank farm	18% Caustic	JCI 05	STEEL	U.S		NA
Tank farm	25% Caustic	JCI 06	STEEL	✓	✓	NA
Tank farm	Bleach reactor vat 1000	JCI 08	XLPE	✓	✓	✓
Tank farm	Bleach reactor vat 2000	JCI 09	XLPE	✓	✓	✓
Tank farm	Bleach storage	JCI 10	XLPE	✓	✓	✓
Tank farm	Bleach storage	JCI 11	XLPE	✓	✓	✓
Tank farm	Rain storage	JCI 14	XLPE	✓	✓	NA
Tank farm	Waste water	JCI 15	XLPE	✓	✓	NA
Tank farm	Sodium bisulfite	NS 16	XLPE	✓	✓	NA
Tank farm	Bleach storage	JCI 17	XLPE	✓	✓	NA
Tank farm	50% Caustic	NS 18	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 19	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 20	XLPE	✓	✓	NA
Tank farm	Potassium Hydroxide	NS 21	XLPE	✓	✓	NA
Tank farm	Sulfuric acid	NS 22	XLPE	✓	✓	NA
Tank farm	Hydrochloric acid	NS 23	XLPE	✓	✓	NA

PM - Mitigation Equipment

Expansion Chambers

Location	Specific Function	External Inspection	Rupture Disc	Pressure Gauge	Bypass or Blow Off Valves
Blow gas tank	Over pressure protection	✓	✓	✓	NA

Vacuum Alarm System

Location	Internal and External Inspections	All Valves	Tubing	Pressure Switch	System Function Test
Vacuum tank	✓	✓	✓	✓	✓

Vat Control System

Location	System Function Checks	Product	Actuated Valves	Probe Calibration	Electrical Connections
Vat 1000	✓	Bleach	✓	✓	✓
Vat 2000	✓	Bleach	✓	✓	✓

Gas Detection System

Location	System Function Test	Gas	External Inspection	Zero Probe	Electrical Connection
Cl2 cyl. Area	✓	Cl2	✓	✓	✓
Loading dock	✓	Cl2	✓	✓	✓
Cl2 car # 1	✓	Cl2	✓	✓	✓
Cl2 car # 2	✓	Cl2	✓	✓	✓
Bleach vats	✓	Cl2	✓	✓	✓
Bleach machine	✓	Cl2	✓	✓	✓
Boiler room	✓	Cl2	✓	✓	✓
So2 storage	✓	So2	✓	✓	✓

PM - Mitigation Equipment (Additional)

Tank Leveling System

Location	Product	Electrical Connection	High Level Alarm	Low Level Alarm	Inventory Discrepancy
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Bleach vat 1000	✓	✓	✓	
Tank Farm	Bleach vat 2000	✓	✓	✓	
Tank Farm	25% Caustic	✓	✓	✓	
Tank Farm	18% Caustic	OOS			
Tank Farm	Bleach storage	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	

Scale Shutdown System

Location	System Function Test	Electrical Connections	Tubing	Actuated Valve	E-Stop Buttons
Cl2 ton # 1	✓	✓	✓	✓	✓
Cl2 ton # 2	✓	✓	✓	✓	✓
Cl2 ton # 3	✓	✓	✓	✓	✓
Cl2 cyl. # 1	✓	✓	✓	✓	✓
Cl2 cyl. # 2	✓	✓	✓	✓	✓

PM - Air System / Air Related Equipment

Air Filters

Location	Specific Function	External Inspection	Air Filter	Pressure Gauge	Bypass or Blow Valves
Cl2 compressor		✓	✓	✓	✓
Plant compressor		✓	✓	✓	✓

Air Receivers

Location	Specific Function	External Inspection	All Valves	Pressure Gauge	Pressure Relief Valve
Cl2 compressor		✓	✓	✓	✓
plant compressor		✓	✓	✓	✓

Demister

Location	Specific Function	External Inspection	Catch Can	Pressure Gauge	Bypass or Blow Of Valves

Air Back Flow System

System Function Test	Pressure and Pressure Differential Switches	Air Tubing	Gauges	All Valves	Electrical Connections
	✓	✓	✓	✓	✓

ALARM HORNS

Location	Specific Function	External Inspection	Valve	Filter Regulator	Function Test
Bleach machine		✓	NA	NA	✓
Cl2 mitigation		✓	NA	NA	✓
Vacuum alarm		✓	NA	NA	✓
Employee alert		✓	NA	NA	✓

PM - Bleach - Bisulfite Equipment

Cooling Towers

Location	Specific Function	External Inspection	Float Valve	Fan and Fan Motor	Water Distributio Basin
Bleach mach.	Bleach manufacture	✓	✓	✓	✓
		✓	✓	✓	✓
Chiller	Bleach vat cooling				

Heat Exchangers

Location	Specific Function	External Inspection	Mountings	Pressure Gauges	Temperature Gauge
Bleach. Mach	Caustic cooling	✓	✓	✓	✓
Bleach. Mach	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Caustic tanks	Caustic cooling	✓	✓	✓	✓

Sparge Tubes

Location	Specific Function	External Inspection	Throttle Valve	Excess Movement	

Scrubbers

Location	Specific Function	External Inspection	Internal Inspection	Liquid Flow System	Air Movement System

PM - Bleach Machine- Filters - Filter Press

Bleach Machine

Location	External Inspection of the Bleach Machine	Air Tubing	All Piping	Caustic Valves	Water Valves
B.M. room	✓	✓	✓	✓	✓

Bleach Machine

ORP Probes	Control and Metering Equipment	Reactor	Alarm Tests	Electrical Connections	
✓	✓	✓	✓	✓	

Bleach Filter (Cartridge or Bag)

Location	External Inspection	Internal Inspection	Gauges	Manual Valves	Bag or Cartridge Filter
NA					

Bleach Filter (Powell Filter)

Manual Valves	External Inspection	Electrical Connections	Air Lines	Pressure Relief Valve	Barrel Gear Box
✓	✓	✓	✓	✓	✓

Filter Press

Location	External Inspection	Manual Valves	Hydraulic Press	Filter Plates	Filter Cloth or Gaskets
Mud tank	✓	✓	✓	✓	✓

PM - Handling Equipment

Valve Machine

Location	External Inspection	Amp Meter	Lubricated	Valve Chuck	Electrical Connections
Cl2 cyl. Area	✓	✓	✓	✓	✓

Bead Blaster - Tumbler Blaster

Blast Nozzle and Hoses	External Inspection	Tumbler Basket	Moisture Check	Electrical Connections	Vacuum Cleaner a. Dust Bag
NA					

Bead Blaster - Cabinet Blaster

Blast Nozzle and Hoses	External Inspection	Cabinet Glass	Moisture Check	Electrical Connections	Reclaimer and Dus Collector
Valve room	✓	✓	✓	✓	✓

Material Handling Equipment - Carts, Rollers, Ton Lifters, Catwalks, Hoists

Location	Equipment Type	External Inspection	Lubrication	Adjustments	Valves
Loading dock	Bridge Hoist	OOS			
Cl2 ton area	Monorail hoist	✓	✓	✓	NA
Cl2 ton area	Rollers	✓	✓	NA	NA

PM - Hoses

Location	Specific Function	Hose Material	External Inspection	Male Fitting	Female Fitting
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Caustic tanker fill	PVC	✓	✓	✓
Bleach manuf.	Caustic car # 1	RUBBER	✓	✓	✓
Bleach manuf.	Caustic car # 2	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Ton testing	Steam	RUBBER	✓	✓	✓
Ton testing	Air	RUBBER	✓	✓	✓

PM - Daily: Pump Mechanical Seal Check

MI III - 17

Month: Nov. 2011

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pump: Bleach Machine-Cooling																															
Seal Leaks	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Water	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Air														G	G	G	G	G			G	G	G					G	G	G	G
Pump: Bleach Machine-Caustic																															
Seal Leaks	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Water																		E													
Seal Air																															
Pump: Bleach Filter																															
Seal Leaks	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Water	G	G	G	G			G	G	G	G				G	G	G	G	G			G	B	G					G	G	G	G
Seal Air														G	G	G	G	G			G	B	G					G	G	G	G
Pump: Bleach Tanker Load																															
Seal Leaks	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Water	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Air														G	G	G	G	G			G	G	G					G	G	G	G
Pump: Vacuum Pump																															
Seal Leaks	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Water	G	G	G	G			G	G	G	G				G	G	G	G	G			G	G	G					G	G	G	G
Seal Air														G	G	G	G	G			G	G	G					G	G	G	G

G : Good B : Bad

PM - Daily Misc. Equipment Checks

MI III - 18

Branch: TACOMA

Month Of: NOV. 2011

Day	Dew Point Indicator Dew Point Reading	Air Drier Desiccant ~~Pink or Blue~~ G	Air Drier Switching Properly		Water Softener Salt Check		
1	-40	G	✓				
2	-40	G	✓				
3	-40	G	✓				
4	-40	G	✓				
5							
6							
7	-40	G	✓				
8	-40	G	✓				
9	-40	G	✓				
10	-40	G	✓				
11							
12							
13							
14	-40	G	✓				
15	-40	G	✓				
16	-40	G	✓				
17	-40	G	✓				
18	-40	G	✓				
19							
20							
21	-40	G	✓				
22	-40	G	✓				
23	-40	G	✓				
24							
25							
26							
27							
28	-40	G	✓				
29	-40	G	✓				
30	-40	G	✓				
31	-40	G	✓				

PM - Daily Compressor Checks

MI III - 19

Branch: TACOMA **Month:** NOV. 2011

Date	Primary Compressor			Secondary Compressor		
	Oil Level	Leaks	Excessive Noise	Oil Level	Leaks	Excessive Noise
1	✓	NO	NO	✓	NO	NO
2	✓	NO	NO	✓	NO	NO
3	✓	NO	NO	✓	NO	NO
4	✓	NO	NO	✓	NO	NO
5						
6						
7	✓	NO	NO	✓	NO	NO
8	✓	NO	NO	✓	NO	NO
9	✓	NO	NO	✓	NO	NO
10	✓	NO	NO	✓	NO	NO
11						
12						
13						
14	✓	NO	NO	✓	NO	NO
15	✓	NO	NO	✓	NO	NO
16	✓	NO	NO	✓	NO	NO
17	✓	NO	NO	✓	NO	NO
18	✓	NO	NO	✓	NO	NO
19						
20						
21	✓	NO	NO	✓	NO	NO
22	✓	NO	NO	✓	NO	NO
23	✓	NO	NO	✓	NO	NO
24						
25						
26						
27						
28	✓	NO	NO	✓	NO	NO
29	✓	NO	NO	✓	NO	NO
30	✓	NO	NO	✓	NO	NO
31	✓	NO	NO	✓	NO	NO

Comments:

REV 9/27/07

PM - Daily Boiler Checks

MI III - 20

Branch: TACOMA

Month Of: NOV. 2011

Day	Main Blow Down	Surface Blow Down	Low Water Shutoff	H20 Column level	Condensate Return	Water Treatment	Remarks	Inspector
1	✓	✓	✓	✓	✓	✓		K.M.
2	✓	✓	✓	✓	✓	✓		KM
3	✓	✓	✓	✓	✓	✓		K.M
4								
5								
6	✓	✓	✓	✓	✓	✓		
7	✓	✓	✓	✓	✓	✓		KM
8	↑	↑	↑	↑	↑	↑		K.M
9	✓	✓	✓	✓	✓	✓		
10	✓	✓	✓	✓	✓	✓		
11								K.M
12								
13								
14	✓	✓	✓	✓	✓	✓		
15	✓	✓	✓	✓	✓	✓		K.M
16	✓	✓	✓	✓	✓	✓		KM
17	✓	✓	✓	✓	✓	✓		K.M.
18	✓	✓	✓	✓	✓	✓		KM
19								KM
20								
21	✓	✓	✓	✓	✓	✓		
22	✓	✓	✓	✓	✓	✓		KM
23	✓	✓	✓	✓	✓	✓		KM.
24								KM
25								
26								
27		✓						
28	✓	✓	✓	✓	✓	✓		KM.
29	✓	✓	✓	✓	✓	✓		KM
30	✓	✓	✓	✓	✓	✓		KM.
31	✓	✓	✓	✓	✓	✓		KM.

PM - Weekly Water Checks

Branch TACOMA

Month / Year Nov. 2011

	Chill Water Tanks	Bleach Machine Cooling Tower	Branch Vat Cooling Tower	Person Conducting Checks
Week # 1	6.9	7.0	7.0	KM
Week # 2	6.9	7.1	7.1	KM
Week # 3	6.9	7.3	7.0	KM
Week # 4	6.9	7.0	7.1	KM
Week # 5				

Please take a water sample from each of the following sources weekly and check the pH of the water.

The purpose of this test is to check for internal heat exchanger leaks.

These weekly checks are to be made with a **HAND HELD** type pH meter **ONLY.**

The Hand Held unit must be calibrated before use. Do not use pH paper.

Do not attempt adjust the pH of the water in the cooling tower or chill water tanks until talking with Environmental Department.

Lockout / Tagout Log

Month of : [illegible]

Branch TACOMA

Item	LO / TO	Applied		Cleared	
		Date	Name	Date	Name
Vacuum Pump	LO	11-10-11	Ken McDonald	11-10-11	Ken McDonald
Powell Filter	LO	11-22-11	Ken McDonald	11-22-11	Ken McDonald

LO - Lockout, TO - Tagout

Enclosure (5)

MI III - 1

MONTHLY

PREVENTATIVE MAINTENANCE

[redacted]

Month Ending: December 2011

Maintenance Person: Ken McDonald

I certify that I have completed all Monthly Preventative Maintenance Checks in accordance with JCI - Standard Operating Procedures.

[redacted]

PM - Actuated Valves

Location	Specific Function	Cycled	Air Tubing & Connections	Body or Actuator Bolts	Valve Adapter	Valve Packing
Ton fill # 1	Auto shut off	X	✓	✓	✓	✓
Ton fill # 2	Auto shut off	✓	✓	✓	✓	✓
Ton fill #3	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 1	Auto shut off	✓	✓	✓	✓	✓
Cyl fill # 2	Auto shut off	✓	✓	✓	✓	✓
Cl2 to vats	Mitigation	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Air	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #1	Mitigation - liquid whip	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid header	✓	✓	✓	✓	✓
Cl2 tank car #2	Mitigation - Liquid whip	✓	✓	✓	✓	✓
Bleach mach.	Block valve	✓	✓	✓	✓	✓
Vacuum tank	Mitigation	✓	✓	✓	✓	✓
Vac. Supply	Isolation for power outage	✓	✓	✓	✓	✓
Vat vac select	Vat 1000	✓	✓	✓	✓	✓
Vat vac select	Vat 2000	✓	✓	✓	✓	✓

PM - Manual Valves

Location	Specific Function	Cycled	Body Bolts	Valve Handle	Valve Packing
Cl2 ton # 1	Process vacuum	✓	✓	✓	✓
Cl2 ton # 1	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 1	Blow gas	✓	✓	✓	✓
Cl2 ton # 1	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 1	Liquid	✓	✓	✓	✓
Cl2 ton # 1	Splitter	✓	✓	✓	✓
Cl2 ton # 2	Process vacuum	✓	✓	✓	✓
Cl2 ton # 2	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 2	Blow gas	✓	✓	✓	✓
Cl2 ton # 2	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 2	Liquid	✓	✓	✓	✓
Cl2 ton # 2	Splitter	✓	✓	✓	✓
Cl2 ton # 3	Process vacuum	✓	✓	✓	✓
Cl2 ton # 3	Vacuum back up	✓	✓	✓	✓
Cl2 ton # 3	Blow gas	✓	✓	✓	✓
Cl2 ton # 3	Blow gas back up	✓	✓	✓	✓
Cl2 ton # 3	Liquid	✓	✓	✓	✓
Cl2 ton # 3	Splitter	✓	✓	✓	✓
Cl2 cyl # 1	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 1	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas	✓	✓	✓	✓
Cl2 cyl # 1	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 1	Liquid	✓	✓	✓	✓
Cl2 cyl # 2	Process vacuum	✓	✓	✓	✓
Cl2 cyl # 2	Vacuum back up	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas	✓	✓	✓	✓
Cl2 cyl # 2	Blow gas back up	✓	✓	✓	✓
Cl2 cyl # 2	Liquid	✓	✓	✓	✓
Hypo vat 1000	Liquid	✓	✓	✓	✓
Hypo vat 2000	Liquid	✓	✓	✓	✓
Hypo vats	Liquid back up	✓	✓	✓	✓
Bleach mach	Liquid	✓	✓	✓	✓

PM - Whips & Transfer Hoses

Location	Specific Function	External Inspection	Excessive Moisture	Railcar Nipples	Flanges or Unions
Cl2 Car # 1	Liquid	✓	NO	✓	✓
Cl2 Car # 1	Air	✓	NO	✓	✓
Cl2 Car # 2	Liquid	✓	NO	✓	✓
Cl2 Car # 2	Air	✓	NO	✓	✓
Cl2 ton # 1	Liquid	✓	NO	N/A	N/A
Cl2 ton # 1	Blow gas	✓	NO	N/A	N/A
Cl2 ton # 2	Liquid	✓	NO	N/A	N/A
Cl2 ton # 2	Blow gas	✓	NO	N/A	N/A
Cl2 ton # 3	Liquid	✓	NO	N/A	N/A
Cl2 ton # 3	Blow gas	✓	NO	N/A	N/A
Cl2 cyl # 1	Liquid	✓	NO	N/A	N/A
Cl2 cyl # 2	Liquid	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 ton dump	Blow gas	✓	NO	N/A	N/A
Cl2 cyl dump	Blow gas	✓	NO	N/A	N/A

PM - Gauges

Location	Specific Function	Gauge Type	Diaphragm	External Inspection	Calibration Due
Cl2 car # 1	Liquid pressure	P	✓	✓	
Cl2 car # 1	Air pressure	P	✓	✓	
Cl2 car # 2	Liquid pressure	P	✓	✓	
Cl2 car # 2	Air pressure	P	✓	✓	
Cl2 air	Backflow	P	✓	✓	
Cl2 ton # 1	Liquid pressure	P	✓	✓	
Cl2 ton # 1	Blow gas	P	✓	✓	
Cl2 ton # 1	Vacuum	V	✓	✓	
Cl2 ton # 2	Liquid pressure	P	✓	✓	
Cl2 ton # 2	Blow gas	P	✓	✓	
Cl2 ton # 2	Vacuum	V	✓	✓	
Cl2 ton # 3	Liquid pressure	P	✓	✓	
Cl2 ton # 3	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Liquid pressure	P	✓	✓	
Cl2 cyl. # 1	Blow gas	P	✓	✓	
Cl2 cyl. # 1	Vacuum	V	✓	✓	
Cl2 ton dump	Blow gas	P	✓	✓	
Cl2 cyl. Dump	Blow gas	P	✓	✓	
Cl2 cyl dump	Vacuum	V	✓	✓	
Bleach mach.	Cl2 pressure	P	✓	✓	
Bleach mach.	Caustic pressure	P	✓	✓	
Bleach mach.	water pressure	P	✓	✓	
Bleach mach.	Recycle pressure	P	✓	✓	
Bleach filter	Backwash pressure	P	✓	✓	

PM - Electric Motors

Location	Specific Function	External Inspection	Motor Ventilation	Motor Guard	Excessive Heat	Electrical Connection
Bleach	Bleach circulation pump	✓	✓	✓	NO	✓
Bleach	Vacuum pump	✓	✓	✓	NO	✓
Bleach	Tanker fill pump	✓	✓	✓	NO	✓
Caustic	Caustic circulation pump	✓	✓	✓	NO	✓
Caustic	Bleach machine	✓	✓	✓	NO	✓
Bleach mach.	Recycle	✓	✓	✓	NO	✓
Bleach mach.	Water	✓	✓	✓	NO	✓
Bleach mach.	Cooling water	✓	✓	✓	NO	✓
Chiller	Glycol pump	✓	✓	✓	NO	✓
Chiller	Water pump	✓	✓	✓	NO	✓
Chiller	Heat exchanger pump	✓	✓	✓	NO	✓
E.N.S.	Sump pump	✓	✓	✓	NO	✓
Ton test	Ton test pump	✓	✓	✓	NO	✓
Cooling tower	Bleach machine fan	✓	✓	✓	NO	✓
Cooling tower	Chiller fan	✓	✓	✓	NO	✓
Warehouse	Heater fan - east	✓	✓	✓	NO	✓
Warehouse	Heater fan - west	✓	✓	✓	NO	✓
Bleach filter	Circulation pump	✓	✓	✓	NO	✓
Bleach filter	Backwash drive	✓	✓	✓	NO	✓

PM - Pumps

Location	Specific Function	External Inspection	Pump Coupling	Lubricated	Mechanical Seal
Bleach mach.	Recycle	✓	✓	✓	✓
Bleach mach.	Caustic	✓	✓	✓	✓
Bleach mach.	Water	✓	✓	✓	✓
Bleach mach.	Cooling	✓	✓	✓	✓
Tank farm	Caustic	✓	✓	✓	✓
Tank farm	Vacuum	✓	✓	✓	✓
Tank farm	Bleach circulation	✓	✓	✓	✓
Tank farm	Tanker load	✓	✓	✓	✓
Tank farm	Glycol - heat exchanger	✓	✓	✓	✓
Tank farm	Glycol - chiller	✓	✓	✓	✓
Tank farm	Cooling tower - chiller	✓	✓	✓	✓
Tank farm	Sump pump	✓	✓	✓	NA
Tank farm	Boiler feed	✓	✓	✓	
Ton test	Ton test pump	✓	✓	✓	NA

Location	Specific Function		Tank Material	External Inspection	Valve and Flange Bolts	Expansion Joint
Tank farm	Backwash water	JCI 01	XLPE	✓	✓	✓
Tank farm	Chiller antifreeze	JCI 02	XLPE	✓	✓	NA
Tank farm	Unfiltered bleach	JCI 03	XLPE	✓	✓	✓
Tank farm	Unfiltered bleach	JCI 04	XLPE	✓	✓	✓
Tank farm	18% Caustic	JCI 05	STEEL	✓	✓	NA
Tank farm	25% Caustic	JCI 06	STEEL	✓	✓	NA
Tank farm	Bleach reactor vat 1000	JCI 08	XLPE	✓	✓	
Tank farm	Bleach reactor vat 2000	JCI 09	XLPE	✓	✓	
Tank farm	Bleach storage	JCI 10	XLPE	✓	✓	
Tank farm	Bleach storage	JCI 11	XLPE	✓	✓	
Tank farm	Rain storage	JCI 14	XLPE	✓	✓	NA
Tank farm	Waste water	JCI 15	XLPE	✓	✓	NA
Tank farm	Sodium bisulfite	NS 16	XLPE	✓	✓	NA
Tank farm	Bleach storage	JCI 17	XLPE	✓	✓	NA
Tank farm	50% Caustic	NS 18	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 19	XLPE	✓	✓	NA
Tank farm	Waste water E.N.S.	JCI 20	XLPE	✓	✓	NA
Tank farm	Potassium Hydroxide	NS 21	XLPE	✓	✓	NA
Tank farm	Sulfuric acid	NS 22	XLPE	✓	✓	NA
Tank farm	Hydrochloric acid	NS 23	XLPE	✓	✓	NA

PM - Mitigation Equipment

Expansion Chambers

Location	Specific Function	External Inspection	Rupture Disc	Pressure Gauge	Bypass or Blow Off Valves
Blow gas tank	Over pressure protection	✓	✓	✓	NA

Vacuum Alarm System

Location	Internal and External Inspections	All Valves	Tubing	Pressure Switch	System Function Test
Vacuum tank	✓	✓	✓	✓	✓

Vat Control System

Location	System Function Checks	Product	Actuated Valves	Probe Calibration	Electrical Connections
Vat 1000	✓	Bleach	✓	✓	✓
Vat 2000	✓	Bleach	✓	✓	✓

Gas Detection System

Location	System Function Test	Gas	External Inspection	Zero Probe	Electrical Connection
Cl2 cyl. Area		Cl2	✓	✓	✓
Loading dock		Cl2	✓	✓	✓
Cl2 car # 1		Cl2	✓	✓	✓
Cl2 car # 2		Cl2	✓	✓	✓
Bleach vats		Cl2	✓	✓	✓
Bleach machine		Cl2	✓	✓	✓
Boiler room		Cl2	✓	✓	✓
So2 storage		So2	✓	✓	✓

PM - Mitigation Equipment (Additional)

Tank Leveling System

Location	Product	Electrical Connection	High Level Alarm	Low Level Alarm	Inventory Discrepancy
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Unfiltered bleach	✓	✓	✓	
Tank Farm	Bleach vat 1000	✓	✓	✓	
Tank Farm	Bleach vat 2000	✓	✓	✓	
Tank Farm	25% Caustic	✓	✓	✓	
Tank Farm	18% Caustic	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	
Tank Farm	Bleach storage	✓	✓	✓	

Scale Shutdown System

Location	System Function Test	Electrical Connections	Tubing	Actuated Valve	E-Stop Buttons
Cl2 ton # 1	✓	✓	✓	✓	✓
Cl2 ton # 2	✓	✓	✓	✓	✓
Cl2 ton # 3	✓	✓	✓	✓	✓
Cl2 cyl. # 1	✓	✓	✓	✓	✓
Cl2 cyl. # 2	✓	✓	✓	✓	✓

PM - Air System / Air Related Equipment

Air Filters

Location	Specific Function	External Inspection	Air Filter	Pressure Gauge	Bypass or Blow Off Valves
Cl2 compressor		✓	✓	✓	✓
Plant compressor		✓	✓	✓	✓

Air Receivers

Location	Specific Function	External Inspection	All Valves	Pressure Gauge	Pressure Relief Valve
Cl2 compressor		✓	✓	✓	✓
plant compressor		✓	✓	✓	✓

Demister

Location	Specific Function	External Inspection	Catch Can	Pressure Gauge	Bypass or Blow Off Valves

Air Back Flow System

System Function Test	Pressure and Pressure Differential Switches	Air Tubing	Gauges	All Valves	Electrical Connections
✓	✓	✓	✓	✓	✓

ALARM HORNS

Location	Specific Function	External Inspection	Valve	Filter Regulator	Function Test
Bleach machine		✓	N/A	N/A	✓
Cl2 mitigation		✓	|	|	✓
Vacuum alarm		✓			✓
Employee alert		✓			✓

PM - Bleach - Bisulfite Equipment

Cooling Towers

Location	Specific Function	External Inspection	Float Valve	Fan and Fan Motor	Water Distribution Basin
Bleach mach.	Bleach manufacture	✓	✓	✓	✓
Chiller	Bleach vat cooling	✓	✓	✓	✓

Heat Exchangers

Location	Specific Function	External Inspection	Mountings	Pressure Gauges	Temperature Gauges
Bleach. Mach	Caustic cooling	✓	✓	✓	✓
Bleach. Mach	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Bleach vats	Bleach cooling	✓	✓	✓	✓
Caustic tanks	Caustic cooling	✓	✓	✓	✓

Sparge Tubes

Location	Specific Function	External Inspection	Throttle Valve	Excess Movement	

Scrubbers

Location	Specific Function	External Inspection	Internal Inspection	Liquid Flow System	Air Movement System

PM - Bleach Machine- Filters - Filter Press

Bleach Machine

Location	External Inspection of the Bleach Machine	Air Tubing	All Piping	Caustic Valves	Water Valves
B.M. room	✓	✓	✓	✓	✓

Bleach Machine

ORP Probes	Control and Metering Equipment	Reactor	Alarm Tests	Electrical Connections	
✓	✓	✓	✓	✓	

Bleach Filter (Cartridge or Bag)

Location	External Inspection	Internal Inspection	Gauges	Manual Valves	Bag or Cartridge Filter
NA					

Bleach Filter (Powell Filter)

Manual Valves	External Inspection	Electrical Connections	Air Lines	Pressure Relief Valve	Barrel Gear Box
✓	✓	✓	✓	✓	✓

Filter Press

Location	External Inspection	Manual Valves	Hydraulic Press	Filter Plates	Filter Cloth or Gaskets
Mud tank	✓	✓	✓	✓	✓

PM - Handling Equipment

Valve Machine

Location	External Inspection	Amp Meter	Lubricated	Valve Chuck	Electrical Connections
Cl2 cyl. Area	✓	✓	✓	✓	✓

Bead Blaster - Tumbler Blaster

Blast Nozzle and Hoses	External Inspection	Tumbler Basket	Moisture Check	Electrical Connections	Vacuum Cleaner and Dust Bag
NA					

Bead Blaster - Cabinet Blaster

Blast Nozzle and Hoses	External Inspection	Cabinet Glass	Moisture Check	Electrical Connections	Reclaimer and Dust Collector
Valve room	✓	✓	✓	✓	✓

Material Handling Equipment - Carts, Rollers, Ton Lifters, Catwalks, Hoists

Location	Equipment Type	External Inspection	Lubrication	Adjustments	Valves
Loading dock	Bridge Hoist	005			
Cl2 ton area	Monorail hoist	✓	✓	✓	NA
Cl2 ton area	Rollers	✓	✓	NA	NA

PM - Hoses

Location	Specific Function	Hose Material	External Inspection	Male Fitting	Female Fitting
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Bleach drum fill	PVC	✓	✓	✓
Bleach manuf.	Caustic tanker fill	PVC	✓	✓	✓
Bleach manuf.	Caustic car # 1	RUBBER	✓	✓	✓
Bleach manuf.	Caustic car # 2	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Air	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Water	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Bleach manuf.	Steam	RUBBER	✓	✓	✓
Ton testing	Steam	RUBBER	✓	✓	✓
Ton testing	Air	RUBBER	✓	✓	✓

BACKFLOW PREVENTION ASSEMBLY TEST REPORT

BLUE SKY LANDSCAPE SERVICES INC.
1124 VALLEY AVENUE N.W.
PUYALLUP, WA. 98371
(253) 845-2222

FAXED
NOV 2 2 2011
BY: TG Wilcox

NAME OF PREMISE Jones Chemical Commercial ☒ Residential ☐

SERVICE ADDRESS 1919 Marine Drive CITY Tacoma ZIP 98422

CONTACT PERSON _____ PHONE ( ) _____ FAX ( ) _____

LOCATION OF ASSEMBLY old boiler room

DOWNSTREAM PROCESS chemical DCVA ☐ RPBA ☒ PVBA ☐ OTHER _____

NEW INSTALL ☐ EXISTING ☒ REPLACEMENT ☐ OLD SER. # _____ PROPER INSTALLATION? YES ☒ NO ☐

MAKE OF ASSEMBLY Watts MODEL 909 SERIAL NO. unknown SIZE 2"

	DCVA / (RPBA) CHECK VALVE NO.1	DCVA / (RPBA) CHECK VALVE NO.2	RPBA	PVBA/SVBA AIR INLET
INITIAL TEST PASSED ☒ FAILED ☐	LEAKED ☐ tight PSID	LEAKED ☐ tight PSID	OPENED AT 2.4 PSID #1 CHECK 7.6 PSID AIR GAP OK? ✓	OPENED AT _____ PSID DID NOT OPEN ☐
NEW PARTS AND REPAIRS	CLEAN REPLACE PART ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____	CLEAN REPLACE PART ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____	CLEAN REPLACE PART ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____ ☐ ☐ _____	CHECK VALVE HELD AT _____ PSID LEAKED ☐ CLEANED ☐ REPAIRED ☐
TEST AFTER REPAIRS PASSED ☐ FAILED ☐	LEAKED ☐ _____ PSID	LEAKED ☐ _____ PSID	OPENED AT ____ PSID #1 CHECK _____ PSID	AIR INLET _____ PSID CHK VALVE _____ PSID

AIR GAP INSPECTION: Required minimum air gap separation provided? Yes ☐ No ☐ LINE PRESSURE 98 PSI

REMARKS: _____

CONFINED SPACE? _____

TESTERS SIGNATURE: Randy Horne CERT. NO. B 4360 DATE 10-27-11

TESTERS NAME PRINTED: RANDY HORNE TESTERS PHONE # (253) 845-2222

REPAIRED BY: _____ DATE _____

FINAL TEST BY: _____ CERT. NO. _____ DATE _____

CALIBRATION DATE 01 / 03 / 11 GAUGE # 12080867 MODEL: MIDWEST 845-5

I certify that this report is accurate, and I have used WAC 246-290-490 approved test methods and test equipment.

PM - Weekly Water Checks

Branch TACOMA

Month / Year December 2011

	Chill Water Tanks	Bleach Machine Cooling Tower	Branch Vat Cooling Tower	Person Conducting Checks
Week # 1	6.9	7.1	7.1	KM
Week # 2	6.9	7.0	7.1	KM.
Week # 3	6.9	7.1	7.1	KM.
Week # 4	6.9	7.1	7.0	KM
Week # 5				

Please take a water sample from each of the following sources weekly and check the pH of the water.

The purpose of this test is to check for internal heat exchanger leaks.

These weekly checks are to be made with a **HAND HELD** type pH meter **ONLY.**

The Hand Held unit must be calibrated before use. Do not use pH paper.

Do not attempt adjust the pH of the water in the cooling tower or chill water tanks until talking with Environmental Department.

PM - Daily: Pump Mechanical Seal Check

MI III - 17

Month: December 2011

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pump: Bleach Machine-Cooling																															
Seal Leaks	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Water	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Air																															
Pump: Bleach Machine-Caustic																															
Seal Leaks	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Water																															
Seal Air																															
Pump: Bleach Filter																															
Seal Leaks	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Water	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Air																															
Pump: Bleach Tanker Load																															
Seal Leaks	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Water	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Air																															
Pump: Vacuum Pump																															
Seal Leaks	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Water	G	G			G	G	G	G	G			G	G	G	G	G			G	G	G	G									
Seal Air																															

G : Good B : Bad

PM - Daily Misc. Equipment Checks

MI III - 18

Branch: TACOMA

Month Of: December 2011

Day	Dew Point Indicator Dew Point Reading	Air Drier Desiccant Pink or Blue	Air Drier Switching Properly		Water Softener Salt Check		
1	-40						
2	-40						
3							
4							
5	-40						
6	-40						
7	-40						
8	-40						
9	-40						
10							
11							
12	-40						
13	-40						
14	-40						
15	-40						
16	-40						
17							
18							
19	-40						
20	-40						
21	-40						
22	-40						
23							
24							
25							
26							
27							
28							
29							
30							
31							

PM - Daily Compressor Checks

MI III - 19

Branch: TACOMA **Month:** December 2011

Date	Primary Compressor			Secondary Compressor		
	Oil Level	Leaks	Excessive Noise	Oil Level	Leaks	Excessive Noise
1	✓	NO	NO	✓	NO	NO
2	✓	NO	NO	✓	NO	NO
3						
4						
5	✓	NO	NO	✓	NO	NO
6	✓	NO	NO	✓	NO	NO
7	✓	NO	NO	✓	NO	NO
8	✓	NO	NO	✓	NO	NO
9	✓	NO	NO	✓	NO	NO
10						
11						
12	✓	NO	NO	✓	NO	NO
13	✓	NO	NO	✓	NO	NO
14	✓	NO	NO	✓	NO	NO
15	✓	NO	NO	✓	NO	NO
16	✓	NO	NO	✓	NO	NO
17						
18						
19	✓	NO	NO	✓	NO	NO
20	✓	NO	NO	✓	NO	NO
21	✓	NO	NO	✓	NO	NO
22	✓	NO	NO	✓	NO	NO
23						
24						
25						
26						
27						
28						
29						
30						
31						

Comments: _____

REV 9/27/07

PM - Daily Boiler Checks

MI III - 20

Branch: TACOMA

Month Of: December

Day	Main Blow Down	Surface Blow Down	Low Water Shutoff	H20 Column level	Condensate Return	Water Treatment	Remarks	Inspector
1	✓	✓	✓	✓	✓	✓		K.M.
2	✓	✓	✓	✓	✓	✓		K.M.
3								
4								
5	✓	✓	✓	✓	✓	✓		
6	✓	✓	✓	✓	✓	✓		K.M.
7	✓	✓	✓	✓	✓	✓		K.M.
8	✓	✓	✓	✓	✓	✓		K.M.
9	✓	✓	✓	✓	✓	✓		K.M.
10								K.M.
11								
12	✓	✓	✓	✓	✓	✓		
13	✓	✓	✓	✓	✓	✓		K.M.
14	✓	✓	✓	✓	✓	✓		K.M.
15	✓	✓	✓	✓	✓	✓		K.M.
16	✓	✓	✓	✓	✓	✓		K.M.
17								K.M.
18								
19	✓	✓	✓	✓	✓	✓		
20	✓	✓	✓	✓	✓	✓		K.M.
21	✓	✓	✓	✓	✓	✓		K.M.
22	✓	✓	✓	✓	✓	✓		K.M.
23								K.M.
24								
25								
26								
27								
28								
29								
30								
31								